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Monthly Message

At the beginning of the Civil War the United States Army had no ambulance service, no field hospital system. There were 2 ambulances per regiment and these belonged to the Quartermaster.

The first field hospitals were organized by Surgeon H. S. Hewitt, U.S. Volunteers, at Fort Donaldson in February 1862, the "medical director" of General Grant's Army of "green volunteers." For the campaign he collected all the regimental hospitals and ordered 4 field hospitals for the 28 regiments. Three hospitals were in local buildings; the fourth was in tents—the first tent field hospital of the war. Surgeon Hewitt, judged by his full scholarly and instructive reports, was an educated man and a close observer and a logical reasoner, resourceful and energetic. He was doubtless informed as to ambulance trains and field hospitals in other countries. He was organizing them when Surgeon Tripler of the Regular Corps was clinging to regimental hospitals and rejecting ambulance corps.

In the fall of 1862 the Surgeon General William A. Hammond recommended a pavilion type field hospital to Jonathan Letterman, Medical Director of the Army of the Potomac. All who served in World Wars I and II are familiar with the pavilion type tents of the field and evacuation hospitals. In July 1862 Surgeon Tripler was succeeded as Medical Director of the Army of the Potomac by Surgeon Jonathan Letterman. At that time the ineffectives amounted to 20 percent, the death rate was 50 per thousand. The reasons for this sad state of affairs according to Tripler were:

1. Not enough medical officers;
2. Denial of rank and official position;
3. The idea that surgeons were "merely doctors" to be called on to treat the sick but not to institute sanitary measures;
4. Not having control of transportation;
5. Professional incompetency of some officers.

Letterman, cognizant of Larrey's work, envisioned the whole problem of medical logistics in the field and promptly improved sanitation; instituted ambulances; ambulance companies; and field, evacuation, and general hospitals. Thus at the Battle of Antietam, for the first

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REMINDER: POLL OF READERS ..... June

Have you seen the June issue?

Foreword

The *United States Armed Forces Medical Journal* is a monthly publication of professional and administrative information for medical personnel of the Department of Defense. The Assistant Secretary of Defense (Health and Medical) and the Surgeons General of the United States Army, Navy, and Air Force invite members of the regular and reserve medical services, the professional consultants of the military departments, and other physicians and health scientists with an interest in Department of Defense activities to submit manuscripts for publication in this *Journal*.

FRANK B. BERRY, M.D.
Assistant Secretary of Defense

LIEUTENANT GENERAL LEONARD D. HEATON
Surgeon General, United States Army

REAR ADMIRAL BARTHOLOMEW W. HOGAN
Surgeon General, United States Navy

MAJOR GENERAL OLIVER K. NIESS
Surgeon General, United States Air Force

Dedication of New Building, U.S. Naval Hospital, Portsmouth, Virginia

REAR ADMIRAL EDWARD C. KENNEY, MC, USN

THIS HOUR marks the end of a major construction project to produce a magnificent and functional structure and the beginning of an operational phase, which we fully believe will result in better patient care for those destined to use this facility in time of medical need. This building will serve as a fitting landmark in the progressive community of Portsmouth, Virginia, for many years and will be a haven for those service personnel and their dependents who require medical treatment and hospitalization. We believe that our generation and those to follow will find comfort in the existence of this hospital and that within these walls they will find the means of regaining their health and prolonging their lives through the dedicated efforts of the staff doctors, nurses, hospital corpsmen, and other personnel, both military and civilian. . . .

I think that at today's juncture of time, it is appropriate to review the history of this fine institution and to take cognizance of some of its achievements. The Portsmouth Naval Hospital is 1 of 25 naval hospitals maintained by the Department of the Navy and operated as a management and professional responsibility of the Bureau of Medicine and Surgery. It is the largest naval hospital on the East Coast and the second largest of all naval hospitals. It is also the oldest naval hospital in the United States, having been first commissioned in 1830. Such distinctions will give us a sense and a measurement of its historical heritage and the present-day magnitude of its contribution to the healing arts.

We are standing on land which in 1636 was granted by patent to Captain Thomas Willoughby for the cultivation of tobacco. Willoughby appears not to have made any use of the land, and it passed

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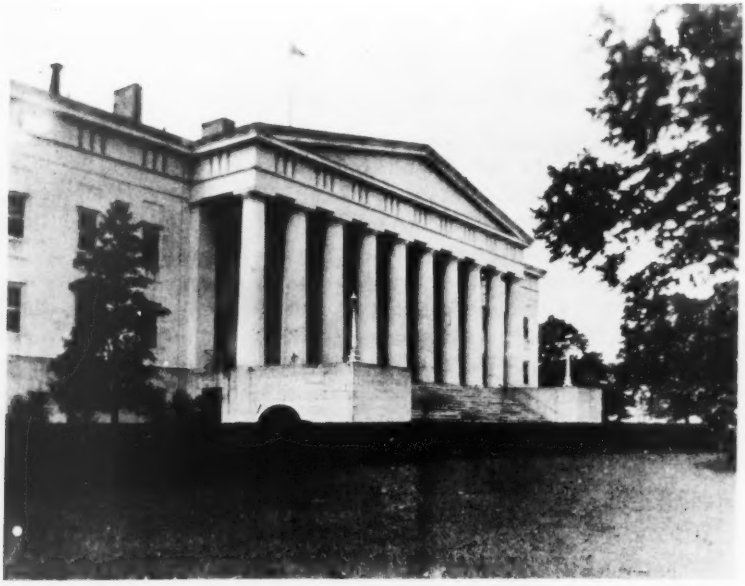
From address presented on 22 April 1960. Admiral Kenney is Deputy Surgeon General, Department of the Navy.

by escheat back to the colony. During the intervening years the land passed through several hands, until in 1794 Colonel Thomas Newton purchased 64 acres of this land for the sum of 394 pounds. In 1799 the United States Government acquired a parcel of 18 acres, which was increased by deed or purchase to a total of 102 acres by the year 1830.



The U.S. Naval Hospital, Portsmouth, Virginia, as it appeared in 1903.

In 1776, Fort Nelson was erected on part of the land, and it continued to guard the entrance and the channel approach to the towns of Norfolk and Portsmouth until 1820, when Fortress Monroe was erected. The land on which the hospital is located is sometimes referred to by the name of the prominent point, which at one time extended about 450 feet farther into the river than it does at present, thus making a large bay to the south, long known as Craford Bay. At one time, this point was called "Musquito Point," later Windmill Point, because of the windmills built there by the Tuckers. After it passed out of the hands of the Tuckers, it was referred to as Musket Point, Fort Point, and finally as Hospital Point.

PORTSMOUTH NAVAL HOSPITAL

The original hospital was first constructed in 1827, and commissioned in 1830, with Surgeon Thomas Williamson as Senior Medical Officer. More than 500,000 bricks of the fort were used in construction of the original building, which still stands and forms the center portico of the main building. Mr. John Haviland, architect, of Philadelphia, Pa., was in charge of construction of the hospital, which was 3 stories in height, above a basement 12 feet in height. A hollow square, 172 feet on its principal front, 192 feet in depth, it was flanked by a Doric portico of 10 columns, with 20 steps 92 feet long, and was the most imposing structure in the vicinity. In 1907, the entire main building was reconstructed, with only the outer walls of the old hospital and the front portico left standing. Additions to the original building were added in 1942–43. Many of the outbuildings were constructed during World War I; however, the greatest expansion and construction of additional buildings were accomplished during World War II, when the hospital had over 3,000 patients.

During its existence the hospital has served its functions commendably during many wars and catastrophes. The first major disaster with which the hospital was called upon to cope was an epidemic of yellow fever, brought to Norfolk and Portsmouth by the ship *Ben Franklin* from the Danish West Indies in 1855. In gratitude for their heroic service, the city of Portsmouth presented to Surgeon Louis Minor and his assistants gold medals with a relief of the hospital on one side.

On 17 June 1898, the President signed the bill inaugurating the Hospital Corps, and in August 1902, the first Hospital Corps Training School in the Navy was opened at this hospital.

On 17 April 1909, an event of major significance occurred. Three Navy nurses arrived to organize nursing at the hospital. By October 1909, there were 36 women nurses in the entire Navy, with 1 chief and 6 ward nurses at Portsmouth.

In December 1953, plans were announced by the Navy Department to construct a 15 million dollar, 15-story hospital building on the existing grounds of the Portsmouth Naval Hospital, and funds were approved by Congress on 18 August 1954. In January 1956, the first phase of construction began. This work included razing of the commanding officer's quarters, relocation of the hospital chapel, and r moval and relocation of trees and shrubs. On 20 June 1956, pile driving began for the foundation of the new hospital.

The hospital has an average daily census of from 1,100 to 1,200 patients, including both active-duty and retired military personnel and their dependents. During the year 1959, a total of 192,000 outpatients were treated in the hospital clinics. There was a total of

21,149 admissions to the hospital during the year 1959, and in the same year 4,528 babies were born in the obstetric department.

This hospital has for many years been fully approved by the Joint Commission on Hospital Accreditation. It is also approved for internship and for residency training in the clinical specialties of surgery, internal medicine, obstetrics and gynecology, orthopedic surgery, and pediatrics, complying in all respects with the rigid standards and requirements of the Council on Medical Education and Hospitals of the American Medical Association and the various specialty boards. The hospital's professional staff consists of carefully selected specialists in every field of clinical practice and includes 20 medical officers serving their internship and 31 medical officers in residency training in the clinical specialties previously mentioned.

The new hospital building at Portsmouth.

In the Department of Defense policy for joint utilization of military health and medical facilities and services the Portsmouth Naval Hospital has been recommended for designation as the major regional treatment facility in the Tidewater area for hospitalization of all members of the Armed Forces when indicated.

It is the third largest organization in the city of Portsmouth, employing some 620 local citizens as civilian employees, and, in addition, has a total of 325 officers and 900 enlisted personnel.

In recognition of the vital importance of the "medical team" concept as a means of providing the best possible patient care, all staff

personnel whether military or civilian undergo a continuing program of education and training, particularly in the area of their specific assignment, designed to improve their ability and effectiveness as members of the medical team. I recognize the challenge to Admiral Van Peenan, the present commanding officer, and his staff in organizing and incorporating this impressive structure as the major unit in the hospital complex, but the Bureau of Medicine and Surgery has every confidence in his professional and administrative ability to accomplish this in an outstanding manner.

In closing, let me say that it is an official, as well as a personal, pleasure to be present today for this dedication. I sincerely wish continued success to the commanding officer and his staff, who will, I am convinced, uphold and enlarge the history and tradition of success in medical achievements, community service, and fleet support for which this hospital has always been well known. This massive structure, with all its modern facilities and all of its staff, exists for no other purpose than to render the best possible medical care to each patient who comes here for help. Each of us will, I am sure, remember this very simple truth.

NICE PHYSICIANS

There are plenty of capable physicians, the need is for physicians who are nice to people. To some, this art seems to be inherent; to others it has to be a conscious and planned part of their behavior. We frequently look askance at those members of our profession who have developed the art of being nice to people to such a high degree while allowing their scientific knowledge to deteriorate. These individuals invariably have highly successful practices much to the dismay and chagrin of their more scientifically oriented colleagues. The patients of these physicians are unusually loyal. Because of our disdain for the professional qualifications of this type of physician, many of us swing rather far in the opposite direction. We sometimes erroneously associate the quality of being "too nice" to our patients with professional mediocrity. Nothing could be farther from the truth.—To Comfort Always (editorial). *Journal of the Medical Association of Georgia*, November 1958.

Recent Developments in Diuretic Agents

MORTON FUCHS, M.D.
JOHN H. MOYER, M.D.
BENJAMIN E. NEWMAN, M.D.

THE EDEMA SYNDROME is a manifestation of numerous pathophysiologic states and presents a challenge to many of the subspecialties of internal medicine as well as other allied medical fields. Underlying many of the clinical states of edema is the problem of excess sodium reabsorption by the renal tubules. Inhibition of sodium reabsorption by the kidney is the cornerstone of the therapy of edema, and therefore the search for newer diuretic agents that fulfil the necessary requisites has been actively pursued.

The ideal diuretic agent produces a large sodium excretion and has no significant influence on other electrolytes, so that clinical electrolyte imbalance and deficiency syndromes are avoided. Since the drug should have continuous action without refractory periods, the problem of maintenance therapy in marked edema states arises. Tolerance should not develop to any significant degree during therapy. Oral administration is most practical and therefore the ideal diuretic agent should be effective by mouth. Absence of toxic reactions with acute and chronic use of the drug is mandatory.

DIURETICS IN COMMON USE

Xanthine and Cytosine Derivatives

In order to meet the above criteria, research over the years has produced various major groups of diuretics differing chemically and

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pharmacologically. Although none has achieved the ideal state, the progress toward this goal is quite evident. The xanthine diuretics, such as aminophylline, can be given only intravenously for any significant effect, which at its best is poor. The cytosine agents, such as aminometradine (Mictine) and amisometradine (Rolicton), have a moderate effect on sodium excretion and can be given orally; but they produce some gastrointestinal side effects, and the refractoriness that develops necessitates intermittent therapy.

Carbonic Anhydrase Inhibitors

The carbonic anhydrase inhibitors, such as acetazolamide (Diamox) and ethoxzolamide (Cardrase) marked an advance in diuretic therapy. Although they are sufficiently potent in many forms of edema, refractoriness develops after 2 to 3 days of administration. The predominance of sodium and bicarbonate excretion with these drugs may produce hyperchloremic acidosis, which is accentuated in the presence of renal insufficiency. However, much has been added to our knowledge of carbonic anhydrase activity, renal tubular function, and biochemistry of other tissues through the study of the carbonic anhydrase inhibitors.

Organomercurials

The organomercurials have been the mainstay of diuretic therapy in recent years and are still the most potent parenteral diuretics. Rapid in onset of activity, they produce an equivalent sodium and chloride excretion with little effect on potassium excretion. Administered orally, the mercurials are active diuretic agents, but a dose equivalent to 40 mg or more of mercury is necessary to produce an adequate response. At these doses there is a high incidence of gastrointestinal side effects. The mercurial diuretics can be safely given intramuscularly, subcutaneously, and intravenously. Their action is continuous and no tolerance is evident on prolonged administration. However, with prolonged administration, a hypochloremic alkalosis may develop, with resultant depression of the diuretic activity. This may be counteracted by the concomitant use of an acidifying agent, such as ammonium chloride given in adequate doses orally.

All the above agents are still playing an active part in our diuretic armamentarium but do not fulfil the necessary requirements of the ideal diuretic agent.

RECENT ADVANCES IN DIURETIC THERAPY

Benzothiadiazine Derivatives

In the past 2 years a new group of agents that more nearly approach the ideal state [1] have been introduced into clinical research and practice. The benzothiadiazine group of diuretics, of which chlorothiazide was the first to be tried clinically, have had widespread use in a short period of time. Chlorothiazide produces few side effects, except for occasional gastrointestinal irritation especially in the older age group, and a rare skin rash of various types with or without thrombocytopenia.[2, 3]

One advantage of these orally administered new agents is that trained personnel are not needed to administer the distasteful "shot." The benzothiadiazine diuretics have not only made the treatment of edema problems easier and more practical; they are also serving as the cornerstone of the treatment of hypertension and are stimulating a renewed interest in the investigation of the basic physiopathology of the hypertensive syndrome.[4]

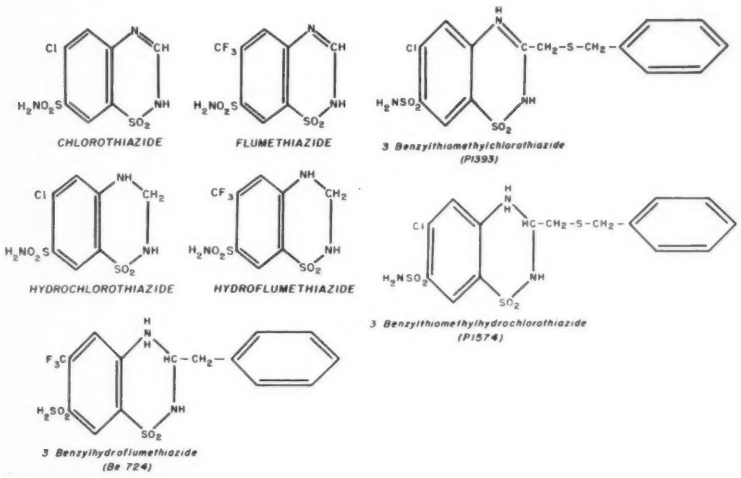

Figure 1. Structural formulas of the benzothiadiazine diuretics.

The thiazides are divided into 2 basic groups (fig. 1). One group remains in the unsaturated state.[5] The other group is hydrogenated by the addition of 2 hydrogen atoms at the double bond between the

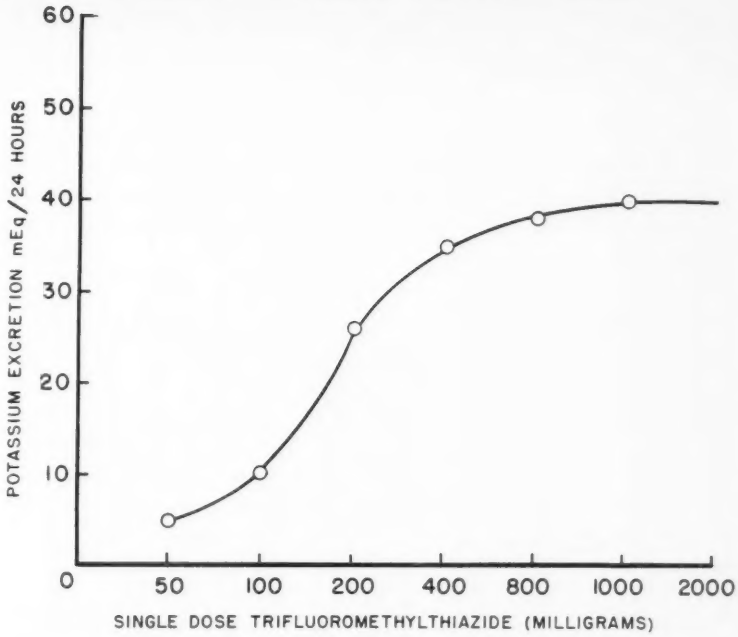

Figure 2. Potassium excretion curve with effective dose range of trifluoromethylthiazide (Ademol).

third and fourth positions of the heterocyclic ring.[5] An attempt at altering some of the pharmacologic characteristics of each of the basic groups of drugs has been made by changing the side chains of the 2 rings composing the benzothiadiazine structure.

Chlorothiazide (fig. 1), an example of the unsaturated group, has the capacity to promote a marked excretion of sodium and chloride in practically equivalent amounts and a moderate potassium excretion.[6]

Chlorothiazide and meralluride (Mercuhydrin) are quite similar in their effects upon sodium and chloride excretion but the parenteral mercurial affects potassium excretion less. Parenteral administration of 1 ml (40 mg) of Mercuhydrin will cause an increase in sodium excretion equivalent to that produced by oral administration of approximately 1,100 mg chlorothiazide.[7] The onset of diuretic activity with orally administered chlorothiazide occurs at a dose of 250 mg and there is a rapidly rising natriuretic activity up to a maximum effective dose of 2,000 mg. Doses above 2,000 mg do not produce a greater natriuretic response.

Flumethiazide (fig. 1), the unsaturated drug in which the chloride atom has been replaced by a trifluoromethyl group, effects quite a similar sodium and chloride excretion through the same dose range as chlorothiazide, but potassium excretion with this drug appears to be prominent at the lower doses and does not increase proportionately with doses above 400 mg (fig. 2). This appears to differ from the effects observed with chlorothiazide, with which potassium excretion and carbonic anhydrase activity appear more evident in the higher dose range.

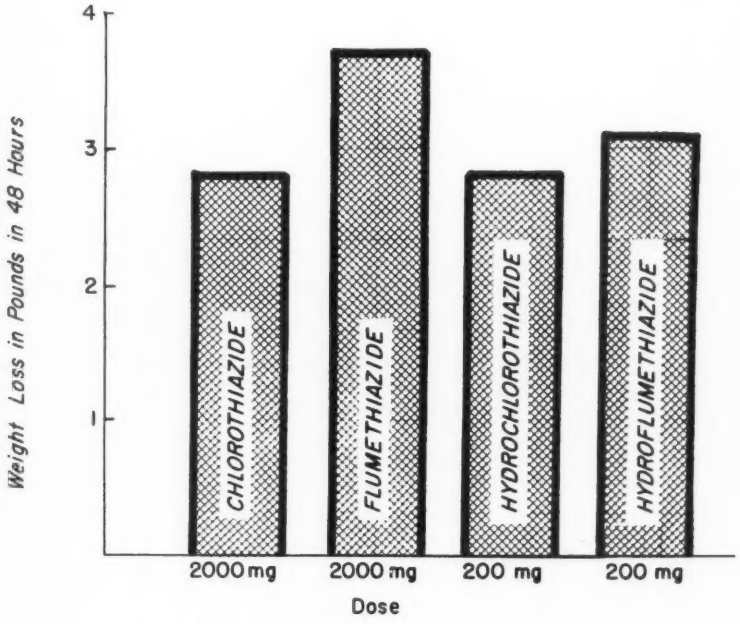

Figure 3. Average 48-hour weight loss with 4 thiazide diuretics in 20 patients with congestive heart failure.

When the above drugs are saturated with two hydrogen atoms, a change in the pharmacologic characteristics and potencies (by weight) is produced. With hydrogenation the dose range of both hydrochlorothiazide and hydroflumethiazide is reduced to one-tenth that of the nonhydrogenated drugs.[8] With the addition of 2 hydrogen atoms to the unsaturated forms, a change in the electrolyte excretion pattern occurs. A dose range of 25 mg to 200 mg of the hydrogenated

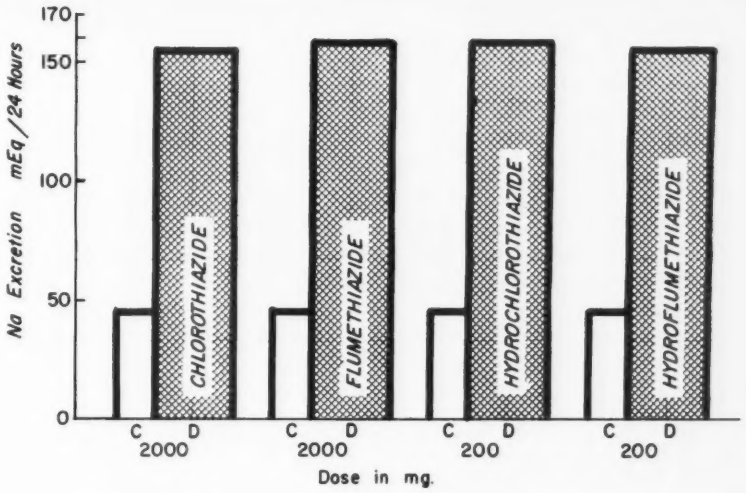

Figure 4. Sodium excretion produced by 4 thiazide diuretics.

drugs produces sodium excretion equivalent to that produced by 250 to 2,000 mg of the nonhydrogenated group. An increased chloride excretion over and above the sodium excretion is also produced by hydrogenation, and therefore the possibility of hypochloremic alkalosis may be more pronounced with these hydrogenated drugs. Potassium excretion with hydrogenated drugs is quite similar to that seen with the nonhydrogenated group.

The comparative effectiveness of the hydrogenated and nonhydrogenated forms of chlorothiazide is shown in figure 3, where the average 48-hour weight response to the maximum effective dose of each of the drugs is demonstrated in a group of 20 patients with congestive heart failure. There is no statistically significant difference in the weight losses produced by the drugs. Figure 4 depicts the sodium excretion produced by the maximum effective dose of each drug. The lack of significant difference in the amount of sodium excreted again demonstrates the similarity in effectiveness of the nonhydrogenated and hydrogenated forms, which differ by a dose ratio of 10 to 1.

The general advantage of the benzothiadiazine drugs appears to be their ability to produce a continuous response until the excess sodium stores have been depleted and compensatory homeostatic mechanisms have become effective. Therapy with the thiazide

derivatives may be accentuated by the simultaneous administration of a mercurial agent.[9]

Chronic administration of these agents may produce elevation of the blood urea nitrogen, possibly because of decreased body sodium and reduced glomerular filtration rate.[10] A tendency toward potassium depletion and the syndrome of hypopotassemia should be avoided by proper dietary methods and by supplementary administration of potassium when necessary. Figure 5 shows the sodium and potassium excretion in a patient with congestive heart failure on 100 mg hydroflumethiazide twice daily; sodium excretion has not returned to control levels by the sixth day of continuous therapy, and the patient has not been completely depleted of excess sodium stores and edema. The continuous activity with few or no side effects illustrated here makes this group of agents almost ideal diuretics.

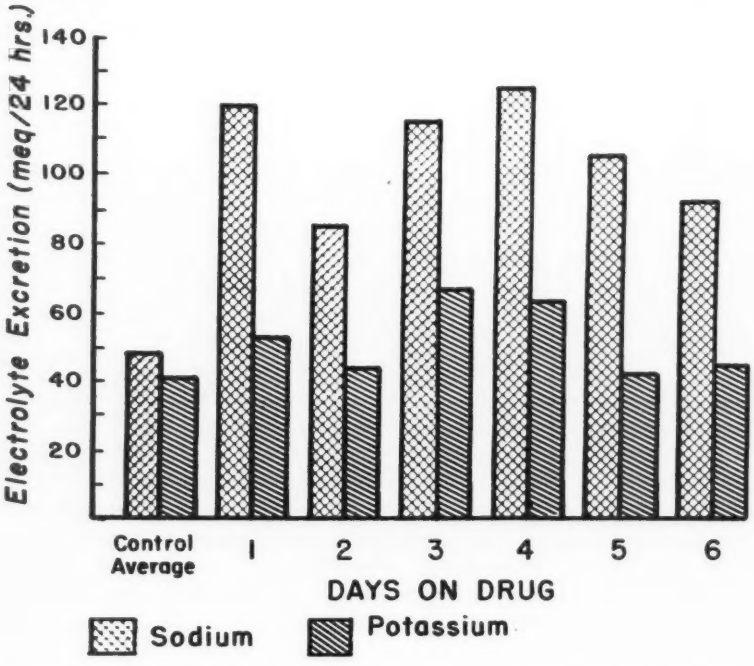

Figure 5. Twenty-four hour sodium and potassium excretion in a patient with congestive heart failure on 100 mg hydroflumethiazide twice a day. Sodium excretion had not returned to control levels by the sixth day of therapy and the patient still had edema.

The diuretic activity of the benzothiadiazine drugs is the result of inhibition of enzyme systems at the renal tubular level; they have no effect on renal blood flow or glomerular filtration rate.[5] A significant increase in urine output occurs within one hour of administration of these drugs, demonstrating the rapid onset of their diuretic activity.

The most recent additions to the benzothiadiazine group are benzylthiomethylchlorothiazide [11] and benzylthiomethylhydrochlorothiazide (fig. 1). Both appear to be similar to the hydrogenated drugs already described but may have greater sodium-excreting potentials. The 3-benzyl derivative of hydroflumethiazide [12] (fig. 1) has similar characteristics but appears to be effective at a lower dose range than hydrogenated chlorothiazide and flumethiazide. Benzthiazide (3-benzylhydroflumethiazide) has a maximum effective dose of 5 to 10 mg and produces significant natriuresis.

The possibility of electrolyte imbalance and depletion syndromes still exists with the benzothiadiazine diuretics as with the other groups. This problem is to be expected because of the pharmacologic properties of the drugs. However, the allowance of an increased salt intake in patients with chronic congestive heart failure is now practical. Once diuretic therapy has helped produce complete cardiac compensation and loss of edema, the liberalization of salt intake by intelligent dieting while on continuous benzothiadiazine therapy may well prevent potassium depletion syndromes as well as the low-salt syndrome in the chronically treated patient. Liberalization of salt in the diet will probably help prevent the elevation of blood urea not uncommonly seen in prolonged drug therapy.

The introduction of the benzothiadiazine drugs has been a major step in the direction of ideal diuretic therapy. Exhaustive investigation with other thiazide derivatives is being pursued to produce more nearly ideal sodium and potassium excretion ratios with greater diuretic effects.

Phthalamidine Derivatives

Figure 6 shows the structural formula of a phthalamidine derivative that appears to have great promise as an efficient diuretic. The drug possesses active sodium-excreting capacity, as well as a marked ability to produce an equivalently significant weight loss in edematous heart failure patients. Toxicity appears to be of no consequence at this point of investigation nor has there as yet been evidence of syndromes of electrolyte imbalance. Another advantage of this drug may be its prolonged natriuretic activity of more than one day with a single dose; thus, less frequent administration of the drug to both the edematous

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patient and the hypertensive patient may be possible. If this property is verified, it may provide for a smoother response in diuretic and antihypertensive therapy.[13]

Antihormonal Therapy

In addition to the rapid progress that has been achieved in diuretic pharmacodynamics, definite attempts are being made to create agents that will counteract certain phases of the physiopathology of edema syndromes. In many cases of edema associated with heart failure and hepatocellular decompensation, there is progressive deterioration in response to the available potent diuretic agents. This may be partially due to secondary influences that are not part of the original disruption of normal physiology but that occur as a result of it. Such a problem is secondary aldosteronism, in which a high gradient of sodium reabsorption is maintained by the renal tubules. Eliminating the influence of aldosterone in these patients would facilitate the excretion of sodium and potentiate the action of the commonly used diuretics. Figure 7 shows the structural formula of a spirolactone, which acts as an antialdosterone agent by inhibiting the action of aldosterone on the renal tubule. Its use would be primarily in those edema problems where secondary aldosteronism has significant influence. Of significant importance also is the fact that aldosterone inhibition will reduce potassium excretion; thus, spirolactones when used with the benzothiadiazine agents may reduce potassium loss in the edematous patient.[14]

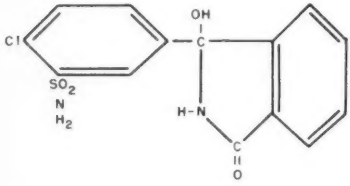

Figure 6 (left). Structural formula of 3-hydroxy-4-chloro-3-sulfumyl-phenylphthalamidine (G33182).

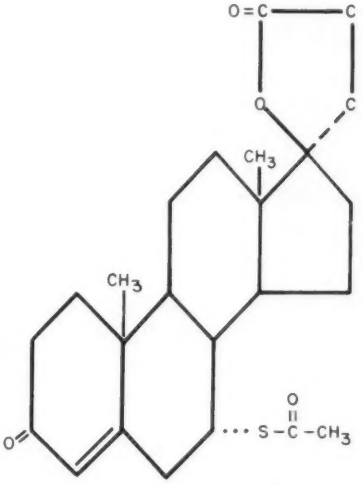

Figure 7 (right). Structural formula of an antialdosterone agent, spirolactone (SC9420).

CONCLUSIONS

The progress of the past several years in diuretic research has been gratifying. The physician has at hand potent diuretic agents that allow for prompt reversal of the edema state and the patient has nontoxic drugs that can be taken orally with liberalization of salt intake, so that he may lead a relatively normal life. The high efficiency of these newer agents, however, does not permit observation of patients to be neglected since undesirable effects may ultimately occur with continuous long-term administration.

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Base Level Veterinary Public Health

LIEUTENANT COLONEL ROBERT L. HUMMER, USAF, VC

THE AIR FORCE VETERINARY SERVICE supports certain aspects of the Air Force preventive medicine program. This program's objectives are to preserve and improve health by inspection, removal, or control of factors that may adversely affect individual well-being. The objectives of veterinary public health are utilization of veterinary medical arts and sciences to prevent disease and promote the well-being and efficiency of man. The professional capability inherent in veterinary science is used in its broadest application in development and operation of the total Air Force health program.

Veterinary public health activities at the base level are conducted as part of the preventive medicine program, which operates on a team concept. This team consists of the preventive medicine officer, sanitary and industrial hygiene engineer, veterinary officer, and any other commissioned officers and preventive medicine specialists the local situation may require. However, the director of Base Medical Services may have to function with only 1 or 2 members of this team, particularly at smaller bases where full-time assignment of an engineer, veterinary officer, or preventive medicine officer is not justified. Where this is the situation, technical specialties required for a given situation are provided on a consultant basis from the next higher major command headquarters.

When participating in the base preventive medicine program, the veterinary officer is designated as an assistant to the preventive medicine officer. In this capacity he performs portions of the environmental health program specifically delegated to him as well as medical inspection of military food service facilities, food equipment, and nutritional aspects of food processing, preservation, and conservation. He also provides a veterinary public health program, with particular emphasis on prevention and control of diseases of animals transmissible to man.

From 7100th Support Wing, APO 633, New York, N.Y. Presented 5–7 May 1959 at joint USAFE and USAREUR Veterinary Conference, Garmisch, Germany.

When the veterinary officer is functioning as a veterinarian, using his specialist's technical knowledge as it pertains to food inspection and to the treatment of government-owned animals, he functions independently of the preventive medicine officer. When dealing with diseases of animals transmissible to man, medical aspects of food service sanitation, barracks inspection, insect and rodent control, and other matters pertaining to environmental sanitation, he coordinates his efforts with those of the preventive medicine officer.

Responsibility for the preventive medicine program belongs to the director of Base Medical Services and cannot be delegated. The base medical service is so organized that the base veterinarian and preventive medicine officer, among others, report directly to the director of Base Medical Services (fig. 1). Personnel on his staff may be used as available to implement and assist in the preventive medicine program if the situation so indicates.

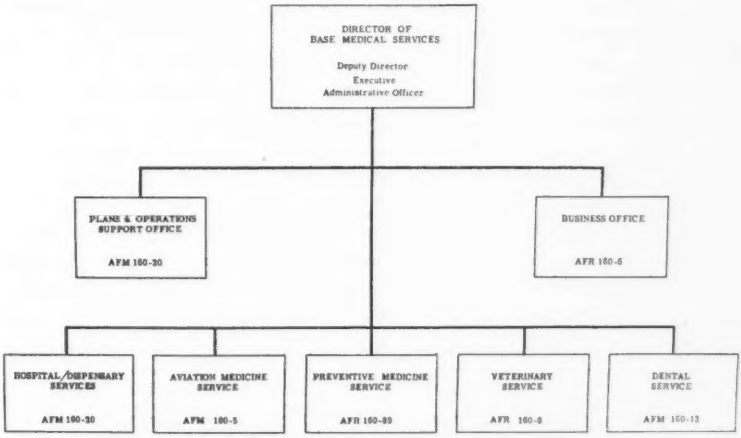

Figure 1. Typical base medical service functional arrangement.

Veterinary officers should not engage in activities that are specifically those of human medicine, such as venereal disease control, the professional phase of immunization of personnel, industrial hygiene, occupational medicine, and physical examination of food handlers. The extent of their participation in preventive medicine activities must also be determined by existing veterinary work loads and availability of other qualified personnel.

Specific duties performed in a base veterinary public health program

will vary from base to base. In general, they fall into 5 broad categories: veterinary food inspection, zoonotic disease control, nutrition, environmental health, and medical passive defense.

Veterinary Food Inspection

Veterinary food inspection at base level should be identical with the similar function at a post, camp, or station. Therefore, this subject will not be discussed further.

Zoonotic Disease Control

Air Force veterinary officers conduct zoonotic disease control clinics in an effort to reduce this reservoir of diseases to a minimum. They see pet animals to administer immunizations, and to perform routine clinical examinations, and are thereby enabled to determine the prevalence of zoonotic diseases in a military community and to advise the director of Base Medical Services accordingly. Among these diseases are rabies, ringworm, intestinal parasites, leptospirosis, and psittacosis. Other diseases may be encountered in various parts of the world.

Veterinarians serving on bases outside the continental limits of the United States perform service to humanity and assist in international relations by conducting bovine tuberculosis eradication programs, and helping local livestock regulatory officials upgrade their activities. For example, the veterinary officer at Keflavik Air Force Base in Iceland has assisted with the local tuberculosis eradication program, and has helped modify local livestock regulations to make them coincide more closely with technical aspects of their counterpart in the United States Department of Agriculture. As a result of his efforts, a safe supply of fresh milk and an improved animal disease control program have been established.

In Wiesbaden, Germany, the base veterinarian became aware of several cases of suspected psittacosis. Close liaison was maintained with German public health officials, and fortunately, no ill effects were experienced by exposed subjects. This exchange of professional information also resulted in improved regulations in the area and a stronger German-American relationship.

Nutrition

A veterinarian can contribute to the well-being of members of the command from a nutritional standpoint. Basic training in nutrition and close association with food supplies make him an important member of the base menu-planning board, and a valuable part of the total

nutrition program. He may advise on such matters as availability, quality, and condition of centrally and locally procured foods; the condition of subsistence in storage; and proper methods of storing food to retain the highest possible nutritive value. He also assists by maintaining liaison with military and civilian agencies concerned with supply and sanitary control of subsistence. Veterinary participation in nutritional surveys has also proved beneficial.

Environmental Health

In the broad sense, any factor existing in the environment or affecting the environment of military personnel could be included in this category. However, for purposes of this discussion, only those aspects requiring frequent monitoring by veterinary personnel participating in the preventive medicine program are included.

Medical aspects of food service. With support of the surgeon general of the Air Force, veterinary officers and others have placed considerable emphasis on maintaining high standards of sanitation in all food facilities. Emphasis is also placed on the health status of all food service employees. The human body is a potential source of pathogenic organisms transmissible by carriers or infected hosts to susceptible subjects. Thus, close supervision of the health of these personnel is important.

Occasionally veterinary officers, at the insistence of physicians, become engaged in performing certain aspects of physical examinations foreign to veterinary medicine. Veterinary officers should not perform any part of the physical examination of food handlers. If asked to do so by a physician or a mess officer, the veterinarian should remind them of his limitations from a professional standpoint.

The base veterinarian contributes freely to the educational program presented for all food handlers. He frequently represents the preventive medicine officer in this program and presents data related to medical aspects of food service sanitation and hygiene.

Water and sewage treatment. In the absence of a sanitary and industrial hygiene engineer, the base veterinarian is often the only member of the medical staff who has had any practical experience with water and sewage treatment. Frequently a veterinary officer is asked by the commanding officer to assist in the solution of problems associated with water or sewage. Veterinary officers must recognize their limitations in these areas and assist where their capabilities permit. They should suggest that consultant services be obtained rather than jeopardize the health of the command by making improvisations founded on limited experience.

Routine sampling of water to test for residual chlorine is a simple

procedure. Proper collection of samples for bacteriologic analysis, which requires more care and attention to details if results are to be reliable, can be performed by veterinarians and veterinary technicians who have been informed about problems inherent in the technic of collection.

Ear and throat infections and mycotic infections of the feet are commonly associated with swimming pools. Bathhouse and latrine sanitation is important and must be recognized by the veterinarian if proper conditions are to prevail.

A properly constructed swimming pool will include scum gutters, a means for recirculating, filtering, and chlorinating the water, and shower baths with hot and cold water. Every well-regulated swimming pool should have rules properly posted and someone in authority to enforce them. Although enforcement of these rules is not a medical problem, the inspector of the pool should determine the extent of enforcement during his official visit to the area.

Medical Passive Defense

The nature of biologic warfare and the characteristics of many potential agents, both antianimal and antipersonnel, make the base veterinarian an important member of the Air Force biologic warfare defense team. In the event of atomic or thermonuclear warfare, the veterinary officer's primary concern would be the effect of ionizing radiation on subsistence supplies and facilities utilized for storage, preparation, and serving of foods. It would be his responsibility to evaluate exposed livestock, and to make recommendations on their slaughter and use for food, as well as on consumption of contaminated foods. The responsibilities of veterinarians in chemical warfare defense and in radiologic defense will revolve around affected human food supplies.

The need for the services of professionally trained military personnel other than physicians in a mass casualty situation has also been recognized. Veterinary officers and other members of the Air Force medical service are being cross-trained so that services of the physician can be extended to cope with this projected demand for emergency medical treatment. Specific courses for this cross-training have already been formulated.

A well-organized base level veterinary public health program will reflect the technical, administrative, and diplomatic ability of the person directing it. Unfortunately, too many veterinary officers, especially those with limited experience, are unable to obtain corrective action because of ineffective powers of communication combined

with a poor reporting system. Frequently verbal reports or verbose reports in letter form are hastily prepared and practically meaningless. Standardized forms are preferable, but must be completed in such a manner that the person accompanying the inspector clearly understands the discrepancies and the corrective action desired.

When an establishment, whether beauty parlor, food-service facility, or dairy farm, is inspected, a written record of the findings should be presented to the representative of the facility who accompanied the inspector. A facility should never be inspected unless authority to do so has been granted and an official representative is available to accompany the inspector. The practice of allowing 48 hours to "clean up" a dining hall or club when highly unsatisfactory conditions have been noted during inspection is also unsound.

Two types of inspection reports have been found to be effective—routine reports and letter reports. Routine discrepancies of a minor nature may be recorded on a standard inspection form signed by the inspector and the representative of the facility; one copy may be left with the representative and the other retained by the inspector as a file copy. When major or recurring discrepancies are found, a detailed report in letter form, documented with well-selected photographs, should be sent to the officer in charge of the facility through the director of Base Medical Services. Another copy should be sent directly to the base inspector. The philosophy in this approach is that routine reports can be sent to the person responsible for taking corrective action, whereas reports demanding additional support should be directed to persons in command. In the latter case, stipulating a reasonable length of time in which corrective action is to be completed has proved effective.

A review of the proposed inspection procedure is suggested before beginning to evaluate the sanitary aspects of an operation. The most diplomatic method of presenting findings to the supervisor, and the most effective means of arousing his desire to take the necessary corrective action should be determined. In this regard it is suggested that the inspector learn to play the role of health educator—a role he can fill only by understanding both sides of the problem, by discussing discrepancies with the representative, and by presenting one or more acceptable means of correcting them.

The base level veterinary public health program has had approximately 15 years of trial-and-error development. The team concept has been adopted as a preventive medicine tool in both military and civilian public health circles. The Air Force veterinarian has been given a permanent and important position on this team, which has enhanced both his professional and his social stature.

SUMMARY

The role of the veterinarian as part of the Air Force preventive medicine program at base level is described. The basic duties of the veterinarian include veterinary food inspection, zoonotic disease control, nutrition, environmental health, and defense against biologic, chemical, and radiologic warfare. As assistant to the preventive medicine officer, the veterinarian inspects military food service facilities and food equipment and is concerned with the nutritional aspects of food processing, preservation, and conservation, in addition to maintaining a veterinary public health program. The veterinarian should not assume duties that are specifically those of human medicine, such as venereal disease control, immunization of personnel, industrial hygiene, occupational medicine, and physical examination of food handlers. Clear inspection reports and a diplomatic approach are important in obtaining needed corrective action.

CALLING THE BLUFF

The drug hearings were launched after two years of preparation. Ostensibly they are directed to determine whether monopolistic practices exist in the drug industry—and whether new legislation is necessary in order to protect the interest of free enterprise. . . . What we heard . . . made big, damning headlines the country over. The headlines did not reflect the facts—they were produced by one-sided statistical and accounting manipulations. They announced to the unsuspecting reader the evil doings of the drug makers—who supposedly collected profits of 1000, 2000 and up to 10,000 percents. This type of manipulated "fact-finding" went on for three sessions. Only on the fourth session, under my insisting cross examination, was the bluff called. There were, instead, profits averaging 13% of sales and dividends to stockholders amounting to five or six percent. Figures of tremendous profits are easy to manufacture—all you have to do is to select a few isolated examples and present them as proof of the total truth. Yet to judge a total drug operation by profits from one successful product, out of 500, is misleading. And to say that a manufacturer makes an unconscionable profit of several hundred percents—because there is a big markup between the cost of the raw material and the final cost of the product to the consumer—is not overly accurate.—SENATOR ALEXANDER WILEY: Address to the Iowa Pharmaceutical Association's Annual Convention, Cedar Rapids, Iowa, March 8, 1960.

Corneal Contact Lenses: Practice and Complications

CAPTAIN RICHARD K. LANSCHE, MC, USA

THE DEVELOPMENT OF CONTACT LENSES began some 70 years ago with the crude hand-blown glass lenses fashioned by craftsmen in Switzerland and Germany. Today, 2 general types of contact lenses are in use:[1-4] the large scleral type usually filled with some special fluid; and the smaller, more popular corneal type held to the eye by the capillary attraction of tears. Eugene Fick, a physician living in Switzerland, is credited with developing the scleral type as a refractive device in 1887. The first corneal type, which met with limited success for technical reasons, is said to have been designed by Kalt in 1889. The influence of Müller and Zeiss brought a return to the fluid-filled lens with supporting scleral flange.[3] In 1932, Dallos introduced a firm agar that could be used for making direct molds of the front part of the eye, allowing construction of accurately fitted scleral lenses. Four years later Obrig introduced a clear plastic, polymethylmethylacrylate, as a substitute for glass in contact lenses. The plastic had advantages of optic accuracy, lightness, resistance to breakage, and inexpensive manufacture and alteration. Nevertheless, scleral lenses were still difficult to fit and wear, and interfered so greatly with corneal metabolism that corneal clouding developed after only a few hours.

Shortly after World War II, Kevin Tuohy introduced a revolutionary corneal-type lens that could be fitted easily and worn for long periods without corneal edema. Since then a number of modifications of this basic corneal lens have produced a lens that is thinner, smoother, smaller, lighter, more pliable, and closer to the contour of each patient's cornea. On the strength of these improvements, 70 percent of patients earnestly desiring lenses can be assured of at least 6 hours a day of fairly comfortable wear and often of all-day wear. Corneal-type lenses have gained widespread acceptance by doctors and patients

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From 11th Field Hospital, APO 178, New York, N.Y.

because of the greater ease with which they may be manufactured, fitted, and worn for long periods.

Future technical breakthroughs in this field depend on discovery of a lens material that is more porous and hygroscopic, allowing freer exchange of water and metabolites between the environments on either side of the lens. Rapid strides toward developing a bifocal corneal lens indicate that inventive interest in this field will be maintained at a high level.

The technics employed in fitting as intimate a device as a contact lens in an area as sensitive as the eye are not simple, and the technical, mechanical, and individual problems concerned in fitting the subject are too broad to include in this discussion. An ophthalmologist or optometrist, or a lay technician working under their direction, may fit these lenses.

Within the past few years several professional organizations have been formed in the United States to support basic research on contact lenses, sponsor educational programs and meetings, and establish needed standards of training and competence for practitioners. These organizations will undoubtedly stimulate rapid growth of the entire field.

Since perhaps 85 percent or more of contact lenses in use today are corneal in type, the bulk of this report deals with these lenses.

INDICATIONS

Indications for prescribing corneal lenses are diverse. Improvement of appearance is the reason given or implied in the majority of cases.

An irregular cornea or small central corneal scar is the most important medical indication. Substituting the smooth spherical surface of a contact lens for such an imperfect cornea neutralizes many optical disadvantages. In fact, candidates for corneal transplantation should have a thorough trial with these lenses to ascertain whether such an operation is the only solution to their optical problem.

The safety of contact lenses is an attraction for many athletes. Since they are made of plastic and fit behind the lids, there is no danger of breakage on impact. However, the price of this protection is occasional displacement from the cornea or loss on the playing field after a jolt.

Persons with a high degree of anisometropia, either congenital or resulting from monocular cataract surgery, are sometimes greatly benefited by contact lenses, which restore binocular vision unobtainable with spectacles. Also, since corneal lenses move with the eyes, they prevent the unpleasant vertically displaced double vision that

some patients with a high degree of anisometropia experience when looking away from the optical center of ordinary spectacle lenses, as in reading.

As low vision aids, contact lenses have grown steadily in importance. After removal of cataracts they allow the patient to regain a more normal-sized retinal image and a wider visual field less distorted than that viewed through spectacles. With such lenses there is no need for the patient to learn new perceptions of size and space as there would be with spectacles. Highly myopic patients, able to read only the letter "E" of the large test chart at 20 feet with the best spectacles, may note remarkable improvement in visual acuity and visual field with contact lenses. Other patients with low vision from any cause may achieve varying degrees of improved vision by a combination of contact lens and spectacle lens of proper power to form a telescope, enlarging the retinal image size up to 2.5 times.

Placing a cosmetic contact lens over a blind unsightly eye may restore completely normal appearance. This lens, made and colored to match the seeing eye, is no more than an outer shell hiding the disfigured eye beneath. Its availability is welcome to many patients who do not wish to part with a blind and disfigured yet comfortable eye. Since the sclera is frequently disfigured in these cases, a scleral lens rather than the smaller corneal lens is usually necessary.

Contact lenses have sometimes been used by surgeons during corneal transplantation in an attempt to simplify fixation of the grafted button of cornea. Either a normal corneal lens or a fenestrated modification is sutured to the periphery of the cornea, serving as a stent to hold the central graft in place by capillary attraction, until wound healing occurs.

Recently, several types of bifocal contact lenses have been tried on a number of patients. Insufficient evidence is available at present to predict how successfully these lenses will be worn.

CONTRAINDICATIONS

The major contraindication to the use of contact lenses is low motivation on the part of the patient.

Active or recurrent inflammatory external eye disease comprises the primary medical contraindication. Diseases such as recurrent corneal ulcer, conjunctivitis, blepharitis, rosacea, or ocular allergy should be sufficient reason to discourage their use, at least temporarily.

Patients with unusually sensitive eyes, tight eyelids, tendency to blepharospasm, or unconscious fear have so much difficulty in adjusting to contact lenses that unusually strong motivation on the part

of both patient and fitter is required; one or the other usually lacks the time to adjust or the stamina to continue past the initial trial stage.

Patients with low refractive errors—from +1.00 to −0.75 diopters—probably have more difficulty with, and less need for, corneal lenses. Many of these people can do without spectacles or wear them only occasionally. On the other hand, patients with unusually large bilateral refractive errors may have so much difficulty in inserting or removing these minute devices that they may be unable to continue with their use. Substitution of the large scleral lens may sometimes solve this problem.

DISADVANTAGES

The major disadvantages of contact lenses at the present time are that they are not suitable for all people; they are expensive, ranging from $75 to $225 in the United States; considerable skill is required for fitting; time is needed for adjustment, and there is potential danger of eye infection or injury. Further, a wetting agent is usually required to moisten the lens thoroughly before insertion, strict personal cleanliness must be observed, and insertion and removal several times a day comprise an unpleasant chore for many people. Loss of a lens is not uncommon. Occasionally patients will accept substandard vision by a line or two on the testing chart, as compared with that gained through spectacles, in order to wear these lenses, or to obtain a comfortable fit in one or both eyes. Most subjects note "spectacle blur" immediately after they remove contact lenses and put on spectacles. This visual phenomenon persists until the cornea regains its curvature. The fact is that many patients lack the necessary motivation to continue wearing these mildly irritating devices when just as satisfactory vision with little effort or discomfort is obtainable with spectacles. Many pairs of contact lenses have quietly found their way into the dresser drawer, tribute to an expensive indulgence that did not offset the trouble it cost.

COMPLICATIONS

Complications arising from the wearing of contact lenses are usually minor but may be serious.

Stinging, burning, tearing, or foreign-body sensations are initial symptoms every patient experiences when a contact lens is first placed on the cornea. Resulting from diffuse pressure of the lens

upon the cornea or from contact of the unadapted eyelids with the edge of the lens, these symptoms usually disappear after 10 to 15 minutes of wear. When such symptoms recur later and increase in intensity, they indicate that the cornea is being strangulated, that foreign material has lodged under the lens, or that the lens is touching the apex of the cornea, and are a warning to remove the lens. If the warning goes unheeded serious difficulties may arise.

The first change likely to occur is superficial spotty necrosis of corneal epithelial cells. This change may produce no complaints; or patients may observe daily fluctuations in the length of time during which the lenses may be comfortably worn, "spectacle blur" lasting many hours, and hot, scratchy eyes even after the lenses are removed. Fluorescein staining under the slit lamp reveals superficial central punctate keratitis. When the central cornea is examined with the keratometer, the mires are slightly distorted. These changes are rapidly reversible and not serious, requiring removal of the lens for a few days to allow the epithelium to regenerate. Continued indifference to recurrent symptoms leads to the second stage of superficial corneal erosion and blurred vision, minor trauma causing the epithelium to separate from the underlying Bowman's membrane. Breaks in corneal epithelium usher in the third stage; the eyes usually become red, painful, and photophobic, the eyelids become spastic, vision is poor, and the patient is in acute distress. Trauma from rough insertion or removal of a lens may produce similar, but less extensive, abrasions. In this stage of corneal abrasion the eye is seriously vulnerable to infection with bacteria, such as pseudomonas, and could be destroyed in 24 to 48 hours.

During the past year at this hospital I have treated 6 patients with uninfected, severe bilateral corneal erosions from corneal contact lenses. Other ophthalmologists serving with U.S. Armed Forces in Germany indicate frequent encounters with similar cases. Effective handling of severe cases should include initial conjunctival smear and culture before the patient is admitted to the hospital. One of the broad-spectrum ophthalmic antibiotic combinations especially effective against gram-negative bacteria is liberally instilled into the eye, firm patches are applied, and sedative and analgesic drugs are administered systemically. Twenty-four hours later a fine layer of corneal epithelium should have regrown and the eye should be much more comfortable. If this does not occur, the base of the abrasion should be scrutinized to determine whether infection has developed. Immediate referral to an ophthalmologist would seem indicated for potentially serious cases. I know of at least 1 unreported instance of a central corneal ulcer with purulent uveitis associated with use of a

corneal contact lens. Another case in which essential bilaterial blindness resulted has been reported in the literature.[5] Many cases of uninfected corneal abrasions are mentioned in the literature, some of these requiring 2 weeks to heal. At the present time the ophthalmic pathology collection of the Armed Forces Institute of Pathology contains no specimens of complications from contact lenses.[6]

Conjunctivitis or infected corneal abrasions are complications that reflect unclean handling of the lens or use of a contaminated cleaning, wetting, or fluorescein staining solution. A news release in the spring of 1959 called worldwide attention to a certain lot of contact lens wetting solution, which was recalled from the trade after an agency of the Federal Government discovered contamination with *Pseudomonas aeruginosa*. Fluorescein solution, widely employed as an adjunct in fitting contact lenses, is notorious for the ease with which it becomes contaminated, especially with *Pseudomonas aeruginosa*. Even a 1:1000 aqueous solution of benzalkonium chloride cannot be relied upon to inhibit this organism.

Finally, it is possible for a corneal contact lens to become firmly fixed to the cornea or globe. Colleagues have mentioned such cases to me, and the following specific instance was reported some years ago.[7] A technician at a commercial exhibit, demonstrating the Tuohy lens during an ophthalmology meeting, placed lenses on the eyes of a member attending the meeting. At the end of 20 minutes intense irritation and blepharospasm developed. The technician was unable to remove the lenses, which had become so tightly adherent that the combined efforts of 2 other ophthalmologists were required to effect removal without damaging the subject's eyes. The lens must have had too steep a curvature and must have adhered like a suction cup to the flatter cornea. Initial estimation of the anterior corneal curvature, now a routine procedure, should prevent such a mishap.

MILITARY IMPLICATIONS

The military implications of contact lenses vary with the existing conditions of war or peace. In time of peace military personnel willing to pay for the purchase should be allowed to obtain these devices if their fitting is supervised by an ophthalmologist. Only in rare instances should contact lenses be provided at government expense. Indications and contraindications for their use are similar to those existing in civilian life.

During periods of active hostilities military personnel should not be allowed to use these devices at any time. Rare exceptions could

be allowed if prescribed specifically by an ophthalmologist. Intentional or unintentional complications arising from improper use or loss of these lenses in time of war could render important personnel ineffective for periods up to 48 hours. A sufficient number of these complications could paralyze military operations.

SUMMARY AND CONCLUSIONS

After a historical outline of the development of contact lenses, the indications for and contraindications to their use are reviewed. Serious complications from wearing the devices are rare and might be reduced still further by scrupulous personal hygiene; by the avoidance of contaminated cleaning, wetting, or fitting solutions; and by wearing lenses more regularly and for shorter periods. Such practices as retaining lenses during sleep, building wearing time too rapidly, and employing saliva as a lubricating or cleansing agent should be shunned. The military aspects of contact lenses are touched upon.

Three broad ingredients are required for success and safety in wearing corneal contact lenses: a highly motivated, cooperative, intelligent patient with genuine need for these lenses; a skillful, well-trained technician, capable of recognizing and of handling or referring all complications that may arise and willing to follow patients closely to detect difficulties early; a superbly constructed lens, custom fitted to the individual cornea. Most patients who abandon their lenses do so because one or more of these ingredients is lacking.

More strict legal and professional standards of training and competence should be required of those wishing to establish a practice in contact lenses.

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Alveolar Hypoventilation and Cardiopulmonary Failure in Obesity

Report of Two Cases

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A SYNDROME OF CARDIOPULMONARY FAILURE secondary to extreme obesity has recently been re-emphasized and popularized by the eponym "pickwickian." [1] Recent articles on this subject have commented on this malapropism,[2] which now appears to be solidly entrenched in medical terminology. Simpson [3] attempted to place this syndrome in its historical perspective by refocusing attention on an eighteenth century report of 2 cases by Dr. John Fothergill.

The causes of alveolar hypoventilation are diverse. In patients with normal lungs there are 4 possible mechanisms for its development: [4] (1) disturbance of ventilatory stimuli, as in the hypoxia of chronic pulmonary disease, with refractoriness of the respiratory center to increased carbon dioxide concentration; (2) impaired neuromuscular coordination, as in poliomyelitis, myasthenia gravis, and progressive spinal muscular atrophy; (3) abnormality of the respiratory center, as in bulbar poliomyelitis; and (4) defective chest-bellows mechanism, as in kyphoscoliosis or obesity.

The 2 examples of this syndrome that are presented below are believed to be primarily related to a defective chest bellows. These cases correspond to the syndrome described by Kerr and Lagen,[5] who reported the presence of cyanosis, reduced vital capacity, polycythemia, and congestive heart failure in several markedly obese patients. These authors suggested that the polycythemia was sec-

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Figure 1 (case 1). Generalized obesity in patient with cardiopulmonary syndrome.

ondary to arterial hypoxemia and noted that weight reduction resulted in complete recovery. Both our patients showed definite evidence of clinical improvement with reduction in weight.

CASE REPORTS

CASE 1. A 27-year-old Negro male cook was admitted to a U.S. Army hospital in September 1957 for evaluation of obesity, hypertension, and ankle edema. Prior to the onset of the present illness, he weighed 200 pounds and was 67 inches

tall. In 1953 he gained an additional 150 pounds and for the first time it was noted that he had mild hypertension and ankle edema. He performed his duties as a cook, frequently injuring himself because of periodic bouts of somnolence. His supervisors complained of his lethargy, and on several occasions he was threatened with court-martial for sleeping on the job.

Physical examination on admission revealed a rotund male of phlegmatic demeanor, weighing 347 pounds (fig. 1). His blood pressure was 160/110 mm Hg, pulse rate 100, respirations 14 per minute without observable motion of the thoracic cage. The lungs were normal to percussion and auscultation. Cardiac auscultation revealed an increase in the second pulmonic sound. No cardiac murmurs were present. The abdomen was markedly protuberant, without palpable visceromegaly. One plus pretibial edema was present.

While hospitalized, the patient had an attack of pneumonia, accompanied by a hemolytic episode manifested by bilirubinemia, reticulocytosis, and erythroid hyperplasia of the bone marrow. During this episode, respiratory insufficiency was marked, and clinical, electrocardiographic, and roentgenographic changes were compatible with acute cardiopulmonary insufficiency. Laboratory data obtained on 3 October 1957 pertinent to the hypoventilation syndrome (table 1) included a hematocrit of 60 percent, carbon dioxide retention, and arterial oxygen desaturation. Upon recovery from this lower respiratory tract infection and with weight reduction of approximately 30 pounds (to 316 pounds), he became more alert and was again able to participate in ward activities. Pulmonary function studies during convalescence on 31 October showed a decreased residual volume, expiratory reserve, and vital and maximal breathing capacities. Subsequent electrocardiograms were within normal limits. Chest roentgenograms were interpreted as showing mild left ventricular enlargement. Upon discharge from the service, no evidence of myocardial insufficiency was present.

Table 1. ***Pulmonary function in 2 patients with cardiopulmonary syndrome***

Date	*Weight (lb)*	*Venous hematocrit (%)*	*Minute volume (cc/min)*	*Expiratory reserve (cc)*	*Residual volume (cc)*	*Vital capacity (cc)*	*Maximum breathing capacity (l/min)*	*% arterial O_2 saturation* / *Vol % arterial CO_2 content*
CASE 1								
3 Oct. 1957	347	60	—	—	—	—	—	69.5
								58.3
31 Oct. 1957	316	50	—	544	917	3,128	96	—
10 Sept. 1958	326	44	9,119	849	1,752	3,487	112	96.8
								—
CASE 2								
5 June 1958	279	58	11,094	619	732	2,917	100	80–90.5
								—
20 Aug. 1958	231	51	16,494	939	1,173	3,218	96	96.8
								—

He was re-evaluated at this hospital in September 1958, at which time his weight was 326 pounds. His pulmonary function studies (table 1) demonstrated improvement compared with his previous evaluation during the convalescent phase of pneumonia, despite the fact that he was now 10 pounds heavier.

Figure 2 (case 2). Cardiopulmonary syndrome. Photograph on the left was taken when the patient weighed 279 pounds, photograph on the right when he weighed 231 pounds. Note pendulous abdomen and lethargic appearance, which improved with weight reduction.

CASE 2. A 30-year-old Negro male cook (fig. 2) was admitted to this hospital in April 1958 with the transfer diagnosis of pickwickian syndrome. The patient was in good health until 1949, when he was admitted to a U.S. Army hospital in Japan because of "encephalitis." Records of this hospitalization have been lost, but the patient stated that he had been observed and treated for 3 months because of recurrent somnolence. Following discharge he continued to exhibit somnolence while at work, and injuries to himself and damage to property resulted. He

underwent many hospital evaluations, during which diagnoses included narcolepsy and postencephalitic syndrome.

Physical examination on admission revealed an obese Negro male, 67 inches tall, weighing 290 pounds. During the course of the physical examination the patient became somnolent and exhibited alternating periods of apnea and tachypnea. He tended to assume a prone position while asleep and it was noted that his respiratory pattern was predominantly abdominal. Pertinent physical findings included a fixed, immobile thoracic cage, mild thoracic kyphosis, and a pendulous, protuberant abdomen. Auscultation of the heart revealed the second pulmonic sound to be increased and louder than the second aortic. There were no cardiac murmurs. One plus brawny edema of the lower extremities was present. An initial electrocardiogram demonstrated peaked P waves in lead II. A chest roentgenogram showed a prominent cardiac silhouette secondary to a pericardial fat pad. Pertinent laboratory studies (table 1) revealed elevated hematocrit, diminished residual volume, expiratory reserve, and vital capacity, and arterial oxygen desaturation. The venous carbon dioxide content was 33 mEq per liter. The remainder of the studies including electroencephalograms were within normal limits.

On admission the patient was placed on an 800-calorie weight-reduction diet, supplemented by a program of active exercises. With a loss of 50 pounds the patient became less somnolent and finally fully alert throughout the entire day. He was able to read, watch television, and play cards without falling asleep over jack pot hands, as he had previously done. His peripheral edema disappeared, A_2 became louder than P_2, and the peaked P wave in the electrocardiogram assumed a more normal contour. The venous carbon dioxide content declined to 27 mEq per liter, and there was improvement in arterial oxygen saturation, venous hematocrit, and pulmonary function (table 1). Because of his continued improvement and cooperation in losing weight, he was returned to military duty.

DISCUSSION

These cases emphasize the borderline state of ventilatory reserve and the cardiopulmonary hazard of excess weight. In the first case, an acute bout of pneumonia resulted in severe cardiac and pulmonary decompensation. The arterial oxygen and carbon dioxide determinations were performed at the onset of the patient's pneumonia and demonstrated marked oxygen desaturation and moderate carbon dioxide retention. With recovery from pneumonia and weight reduction, the arterial oxygen saturation returned to normal. The expiratory reserve, residual volume, and hematocrit also improved, most likely reflecting the patient's recovery from pneumonia in view of the fact that he now weighed 10 pounds more than when previously tested. In the second case, weight loss was associated with striking improvement in arterial oxygenation, venous hematocrit, expiratory reserve, and residual volume.

Normally, the breathing pattern is adjusted to minimize the work of breathing.[6] The work involved in moving the relatively fixed

thoracic cage and elevated diaphragm of the obese person results in a shallow bellows mechanism. Consequently, reduction in tidal volume at a fixed respiratory rate fails to ventilate the alveoli adequately, and hypoxia and hypercapnia follow. The chronic hypoxia results in cyanosis and secondary polycythemia. Improvement occurs with weight reduction.[7] Hypoxia and increase in blood viscosity are factors in the development of pulmonary hypertension and right-sided failure, reflected in both cases reported here by an increase in the second pulmonic sound, peripheral edema, and peaked P waves in lead II of the electrocardiogram. The heart failure, reversible with weight loss, should be undertreated [2] because of the possibility of precipitating thromboses with too rapid diuresis. The use of acidifying salts to potentiate diuretics in a condition already characterized by respiratory acidosis should be instituted with caution.

As observed in both these cases, hypercapnia may lead to symptoms of carbon dioxide narcosis, including somnolence, mental confusion, weakness, lassitude, irritability, tremor or twitching, and alternating episodes of apnea and tachypnea. The management of this problem may require artificial ventilation in an attempt to achieve lower levels of carbon dioxide and resensitize the respiratory center. Why some obese individuals develop alveolar hypoventilation and cardiopulmonary failure—whether because the work of respiration becomes so great that adequate alveolar ventilation cannot occur,[8] or because the respiratory center becomes insensitive to an increase in carbon dioxide tension [9]—is a question that has not been answered. Once alveolar hypoventilation develops, both factors probably operate. In a recent large series,[10] alveolar hypoventilation occurred only in individuals with myxedema or with what was thought to be underlying lung disease, as determined by the uneven distribution of inspired air and by abnormal mechanical tests. Kaufman,[11] on the other hand, presented data which showed that in obese subjects with no clinical evidence of lung disease, there may be an increase in oxygen cost of breathing, resulting perhaps from decreased mobility of the thorax and diaphragm. Many of the otherwise normal obese subjects studied showed hypoxia and hypercapnia upon analysis of arterial gases. In the obese person, mild intrinsic lung disease and increased work of breathing may at times combine to produce alveolar hypoventilation.

From the military standpoint, the early recognition of this syndrome, and an appreciation of its role in poor performance, may prevent inefficiency and loss in manpower. Potentially reversible with loss of weight, it provides an additional justification for insistence upon weight reduction in obese individuals. These patients should be

regarded as sick individuals and treated accordingly; a return to duty is ultimately possible.

SUMMARY

Two cases with the syndrome of alveolar hypoventilation, cardiopulmonary failure, and obesity are presented. The first case demonstrates the borderline state of ventilatory compensation characteristic of these patients, an acute bout of pneumonia resulting in severe cardiac and pulmonary decompensation. Both cases exhibited improvement in clinical manifestations following weight reduction.

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Simple Tubeless Gastric Analysis by the Desmoid Pill Technic

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A PREPARATION FOR TUBELESS GASTRIC ANALYSIS that eliminates the need for chemical determinations came to the authors' attention while they were stationed in Germany. Known as the "desmoid pill" (Desmoidpillen, Pohl), this preparation was devised by Sahli in 1905. Although it has achieved a fair degree of popularity in Europe, there has evidently been no reported experience with the test in the American literature. In Europe, numerous trials have been carried out with the pill and there appears to be good evidence that it is a fairly accurate indicator of the presence or absence of free gastric acid.[1–4] The following report, representing some personal observations, is by no means intended as a thorough evaluation of the desmoid test. The intention is to acquaint the reader with the method, rather than to evaluate it statistically.

MATERIAL AND METHOD

The pill, which measures approximately 0.5 cm. in diameter, consists of a small hard ball of methylene blue wrapped in a thin rubber sheet and tied with plain catgut string. The circular rubber sheet is pulled tightly over the ball of methylene blue and its free edge is gathered together and tied with the catgut string, which approximates 0–0–0–0 surgical catgut in size. Two turns of the catgut are made around the gathered edge and the ends are then tucked under the resulting loops, pulled tight, and cut short (fig. 1). Thus constructed, the small pill can easily be swallowed whole with a sip of water.

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Figure 1. The ball of methylene blue on its rubber sheet, and wrapped and tied.

In the presence of normal gastric secretions the knot opens, with release of methylene blue. This is absorbed and then excreted in the urine, to which it imparts a diagnostically blue or blue-green color. In cases of achlorhydria, the pill passes undisturbed through the gastrointestinal tract with no absorption of the dye. The theories pertaining to the mechanism of the opening of the knot will be presented below. The cost of the pill is approximately 5 cents, and this represents the cost of the whole test, except for the secretory stimulant.

Patients were selected from our general medical wards, some chosen at random and some because achlorhydria was suspected or known. Postgastrectomy patients were excluded because of the obvious difficulties in interpreting the results of conventional fractional analysis.

The patients were given a cup of black coffee at 0730 hours while in the fasting state. One-half hour later the desmoid pill was swallowed with a sip of water. The patients were then instructed to observe their urine closely for any color change during the next 24 hours. If a color change was observed, this was verified by the ward physician, and the time the specimen was voided was recorded.

On the following day a Levin tube was passed into the stomach and a fasting specimen of gastric juice obtained. Following caffeine stimulation, specimens, collected every 15 minutes for a 1-hour period, were analyzed for hydrochloric acid (HCl). If the results of the desmoid test and the fractional analysis did not agree, another pill was given at the time the Levin tube was withdrawn and the urine was observed for an additional 24 hours.

RESULTS

Of 30 patients whose fasting gastric juice contained free HCl, 27 (90 percent) exhibited a positive first desmoid test and 29 (97 percent) a positive second desmoid test (table 1). Of 12 patients whose gastric juice contained free HCl only after stimulation, 10 (83 percent) exhibited a positive first desmoid test and 12 (100 percent) a positive second test. Combining both groups, there was agreement between the 2 methods in 37 of 42 patients (88 percent) with 1 desmoid test, and in 41 of 42 (98 percent) when the test was repeated. It should be mentioned that the 1 patient in whom gastric analysis and desmoid tests did not correspond had a history of achlorhydria on previous fractional gastric analysis.

Table 1. ***Comparison of gastric analysis and desmoid test: on 42 patients with free HCl by gastric analysis***

Gastric analysis		*Desmoid test*			
Type of specimen	*Number of patients*	*Number of patients positive with 1st test*	*Additional patients positive with 2d test*	*Number of patients negative with 2 tests*	*Percent of agreement: $\frac{2 \text{ desmoid tests}}{\text{gastric analysis}} \times 100$*
Fasting	30	27	2	1	97
After stimulation	12	10	2	0	100
Total	42	37	4	1	98

In the above group of 41 patients, 31 (76 percent) found that the color of the urine changed within 5 hours after administration of the pill. In only 2 patients did the color change occur after a 12-hour lapse, and in none after 24 hours.

Unfortunately, we were able to study only 9 patients with achlorhydria, as demonstrated by fractional gastric analysis. In this group (table 2) there was agreement between the 2 forms of test in 6 patients (67 percent). In 1 of the 3 patients in whom the tests did not correspond (macrocytic anemia), normal gastric mucosa was found on gastric biopsy.

DISCUSSION

The mechanism of action of the desmoid pill has been extensively evaluated in Germany. Most workers [1,2] reported that opening of the knot, with subsequent release of the methylene blue, is dependent on gastric digestion of the catgut. This has been found to require a

Table 2. ***Comparison of gastric analysis and desmoid test: in 9 patients with achlorhydria by gastric analysis***

Patient	*Diagnosis*	*Positive 1st desmoid test*	*Positive 2d desmoid test*	*Agreement between gastric analysis and desmoid tests*
1	Pernicious anemia	No	No	Yes
2	Spastic colitis	Yes	No	No
3	Macrocytic anemia	Yes	Yes	No
4	Normal	Yes	Yes	No
5	Hypothyroidism	No	No	Yes
6	Iron-deficiency anemia	No	No	Yes
7	Carcinoma of stomach	No	No	Yes
8	Iron-deficiency anemia	No	No	Yes
9	Unknown	No	No	Yes

pH of 3.5 or less,[5] plus the presence of pepsin in addition to HCl.[3] In this regard the desmoid technic is more than just a test of gastric acidity, for it actually measures total gastric integrity. The catgut is not digested by enzymes of the small bowel,[2] probably because of the alkaline pH. Heinkel and Baumer [5] believed that the pill might open because of contraction of the catgut before its digestion, with resultant release of the single knot used to secure the rubber sheet.

It is important that any medications that act as oxidizing agents be discontinued during the test period. If not, the urine specimens must be heated with acetic acid, because methylene blue has a blue color only in its reduced form. For obvious reasons, antacids and antispasmodics should also be discontinued during the test period.

Matzke [1] reported agreement between the desmoid test and routine gastric analysis in 62 of 67 patients with free HCl by the latter test, and in 22 of 27 with achlorhydria. Most authors [2-4] reported agreement between the pill and conventional gastric analysis in 95 to 98 percent of patients with free HCl and in 90 to 95 percent of those with achlorhydria. In our study there was similar agreement in the group with free HCl but not in the achlorhydria group, although the numbers of patients were too small to provide significant results.

No relationship between the time of urine color change and the degree of gastric acidity has been found. [1]

SUMMARY AND CONCLUSIONS

An inexpensive test for free gastric hydrochloric acid is described. The "desmoid" pill is a small ball of methylene blue wrapped in rubber and tied with catgut, which dissolves in the presence of normal gastric secretions, allowing the dye to be released, absorbed, and

excreted in the urine. Administered to 42 patients whose gastric juice contained free HCl in fasting specimen or after stimulation, the desmoid test gave positive results in all but 1 patient. Of 9 patients with achlorhydria by gastric analysis, 6 also gave negative results with the desmoid test.

The test seems to be a fairly reliable method of screening patients for achlorhydria and requires nothing more than the desmoid pill and a cup of coffee. It is inexpensive and involves little effort. Development of urine color in the laboratory, as in tubeless methods that utilize exchange resins, is not necessary, and the whole test can easily be accomplished by the patient while he is carrying out his normal activities. It would appear wise to have the test repeated if the initial one is negative, in order to increase the degree of accuracy.

Because there is practical need for a tubeless method of gastric analysis, the desmoid test seems to deserve more extensive clinical trials.

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ROADS TO IMMORTALITY

> Neither Milton's imagery nor Harvey's profound biological insight would have reached heights which astonished the world if their early years had been occupied by a rigid curriculum and required hours in "elective" courses rather than in the freedom of study granted even to youths 17 years of age at Cambridge.—William Dock: Curiosity, Culture, and Curricula. *The Journal of the American Medical Association*, February 13, 1960.

Perception of the Horizontal and Vertical in Simulated Subgravity Conditions

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CONCERN THAT WEIGHTLESSNESS may be "the terror of space flight" is being dispelled as experimental studies on the biologic effects of exposure to subgravity and weightlessness provide better understanding. Indeed, Margaria [1] has written that his own and other experiments conducted in flight "suggest that lack of gravity does not lead to any important changes of circulatory and respiratory functions nor with all probability to appreciable changes of nervous and muscular functions." The fact remains, however, that little exact knowledge is available on the role of the labyrinth in sensing body position during exposure to subgravity conditions.

Quantitative experiments to determine perception of the horizontal and vertical in the absence of a visual field and in simulated subgravity conditions, as suggested by Margaria,[2] were conducted at this laboratory.

METHOD

By an adaptation of the method of Witkin and Asch,[3] each subject was seated in a specially constructed chair capable of being tilted from the upright, and was asked to direct the movement of a luminous bar, 39 inches long and 1 inch wide, to what he perceived to be the true horizontal and vertical. The rod, pivoted at its center, rotated on a shaft placed about 5 feet in front of the subject. Attached to the other end of the shaft was a luminous protractor, which turned with the rod and on which errors could be read directly in degrees. The luminous bar, brightened before each test by passing a light over it, was moved to the desired position by the examiner at the

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From Aeromedical Field Laboratory, U.S. Air Force Missile Development Center, Holloman Air Force Base, New Mexico. Project 7851, Task 78501.

Table 1. ***Errors of subjects in perceiving vertical and horizontal in absence of visual field on land and in water: head alone tilted 45° left***

Subject	*Trial*	*Bar movement*	*Error (in degrees)*	
			On land	*In water*
JJ	1 Horizontal	Counterclockwise	2. 0	2
	2 Horizontal	Clockwise	4. 0	3
	3 Vertical	Counterclockwise	2. 0	3
	4 Vertical	Clockwise	2. 0	0
	5 Horizontal	Counterclockwise	4. 0	5
	6 Horizontal	Clockwise	4. 0	8
	7 Vertical	Counterclockwise	3. 5	1
	8 Vertical	Clockwise	4. 0	3
JS	1 Horizontal	Counterclockwise	3. 5	12
	2 Horizontal	Clockwise	2. 0	15
	3 Vertical	Counterclockwise	0. 0	10
	4 Vertical	Clockwise	7. 0	5
	5 Horizontal	Counterclockwise	3. 0	10
	6 Horizontal	Clockwise	5. 0	12
	7 Vertical	Counterclockwise	1. 0	9
	8 Vertical	Clockwise	8. 5	10
JTW	1 Horizontal	Counterclockwise	10. 0	2
	2 Horizontal	Clockwise	2. 0	2
	3 Vertical	Counterclockwise	1. 5	2
	4 Vertical	Clockwise	5. 5	5
	5 Horizontal	Counterclockwise	3. 0	10
	6 Horizontal	Clockwise	2. 0	3
	7 Vertical	Counterclockwise	2. 5	0
	8 Vertical	Clockwise	4. 0	2
RK	1 Horizontal	Counterclockwise	3. 0	20
	2 Horizontal	Clockwise	3. 0	20
	3 Vertical	Counterclockwise	2. 0	6
	4 Vertical	Clockwise	4. 0	6
	5 Horizontal	Counterclockwise	2. 5	6
	6 Horizontal	Clockwise	2. 0	10
	7 Vertical	Counterclockwise	3. 0	5
	8 Vertical	Clockwise	3. 0	10
ECD	1 Horizontal	Counterclockwise	5. 0	4
	2 Horizontal	Clockwise	5. 0	6
	3 Vertical	Counterclockwise	5. 5	10
	4 Vertical	Clockwise	0. 0	14
	5 Horizontal	Counterclockwise	3. 0	6
	6 Horizontal	Clockwise	2. 5	6
	7 Vertical	Counterclockwise	5. 0	2
	8 Vertical	Clockwise	2. 5	7

Table 2. ***Errors of subjects in perceiving vertical and horizontal in absence of visual field on land and in water: body tilted 42° left***

Subject	*Trial*	*Bar movement*	*Error (in degrees)*	
			On land	*In water*
JJ	1 Horizontal	Clockwise	0	3
	2 Horizontal	Counterclockwise	0	1
	3 Vertical	Clockwise	2	5
	4 Vertical	Counterclockwise	0	3
	5 Horizontal	Clockwise	1	4
	6 Horizontal	Counterclockwise	3	5
	7 Vertical	Clockwise	2	2
	8 Vertical	Counterclockwise	4	3
JS	1 Horizontal	Clockwise	2	19
	2 Horizontal	Counterclockwise	2	20
	3 Vertical	Clockwise	2	14
	4 Vertical	Couterclockwise	3	13
	5 Horizontal	Clockwise	1	13
	6 Horizontal	Counterclockwise	0	15
	7 Vertical	Clockwise	0	15
	8 Vertical	Counterclockwise	2	12
JTW	1 Horizontal	Clockwise	0	3
	2 Horizontal	Counterclockwise	2	3
	3 Vertical	Clockwise	3	1
	4 Vertical	Counterclockwise	2	1
	5 Horizontal	Clockwise	0	4
	6 Horizontal	Counterclockwise	0	4
	7 Vertical	Clockwise	4	5
	8 Vertical	Counterclockwise	5	1
RK	1 Horizontal	Clockwise	0	4
	2 Horizontal	Counterclockwise	0	2
	3 Vertical	Clockwise	5	5
	4 Vertical	Counterclockwise	2	0
	5 Horizontal	Clockwise	0	5
	6 Horizontal	Counterclockwise	0	10
	7 Vertical	Clockwise	2	12
	8 Vertical	Counterclockwise	2	7
ECD	1 Horizontal	Clockwise	5	5. 0
	2 Horizontal	Counterclockwise	4	12. 0
	3 Vertical	Clockwise	9	6. 0
	4 Vertical	Counterclockwise	10	8. 0
	5 Horizontal	Clockwise	8	10. 0
	6 Horizontal	Counterclockwise	7	10. 5
	7 Vertical	Clockwise	7	2. 0
	8 Vertical	Counterclockwise	10	5. 0

subject's command. Movement was executed in small steps, and after each turn the subject directed the examiner by means of hand signals until he was satisfied that the rod was in the correct position. When the rod was to be made horizontal, it was placed initially in a vertical position, and vice versa.

Table 3. ***Errors of subjects in perceiving vertical and horizontal in absence of visual field on land and in water: body tilted 28° left***

Subject	*Trial*	*Bar movement*	*Error (in degrees)*	
			On land	*In water*
DB	1 Horizontal	Clockwise	3. 0	1
	2 Horizontal	Clockwise	3. 0	2
	3 Vertical	Clockwise	2. 5	3
	4 Vertical	Clockwise	1. 0	1
	5 Horizontal	Counterclockwise	3. 5	0
	6 Horizontal	Counterclockwise	0. 0	2
	7 Vertical	Counterclockwise	3. 0	3
	8 Vertical	Counterclockwise	0. 0	4
JJ	1 Horizontal	Clockwise	1. 0	0
	2 Horizontal	Clockwise	2. 0	2
	3 Vertical	Clockwise	6. 0	6
	4 Vertical	Clockwise	7. 5	9
	5 Horizontal	Counterclockwise	6. 0	2
	6 Horizontal	Counterclockwise	6. 0	3
	7 Vertical	Counterclockwise	2. 5	8
	8 Vertical	Counterclockwise	3. 5	10
JS	1 Horizontal	Clockwise	7. 0	3
	2 Horizontal	Clockwise	4. 0	0
	3 Vertical	Clockwise	8. 0	4
	4 Vertical	Clockwise	5. 0	5
	5 Horizontal	Counterclockwise	9. 0	2
	6 Horizontal	Counterclockwise	15. 0	8
	7 Vertical	Counterclockwise	3. 5	5
	8 Vertical	Counterclockwise	2. 0	6
JTW	1 Horizontal	Clockwise	2. 5	1
	2 Horizontal	Clockwise	4. 0	2
	3 Vertical	Clockwise	5. 0	2
	4 Vertical	Clockwise	6. 5	1
	5 Horizontal	Counterclockwise	4. 5	3
	6 Horizontal	Counterclockwise	5. 0	2
	7 Vertical	Counterclockwise	3. 0	2
	8 Vertical	Counterclockwise	2. 0	1

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Table 3. ***Errors of subjects in perceiving vertical and horizontal in absence of visual field on land and in water: body tilted 28° left*—Continued.**

Subject	*Trial*	*Bar movement*	*Error (in degrees)*	
			On land	*In water*
RK	1 Horizontal	Clockwise	12. 0	3. 0
	2 Horizontal	Clockwise	9. 0	3. 0
	3 Vertical	Clockwise	15. 0	2. 5
	4 Vertical	Clockwise	16. 0	1. 0
	5 Horizontal	Counterclockwise	13. 0	3. 0
	6 Horizontal	Counterclockwise	16. 0	3. 5
	7 Vertical	Counterclockwise	1. 0	3. 0
	8 Vertical	Counterclockwise	3. 5	10. 0
JM	1 Horizontal	Clockwise	0. 5	3
	2 Horizontal	Clockwise	1. 5	0
	3 Vertical	Clockwise	1. 0	2
	4 Vertical	Clockwise	1. 5	2
	5 Horizontal	Counterclockwise	2. 0	3
	6 Horizontal	Counterclockwise	1. 0	6
	7 Vertical	Counterclockwise	3. 0	8
	8 Vertical	Counterclockwise	0. 5	2.

The experiment was performed under each of the following conditions: head alone tilted 45° left (table 1); body tilted 42° left (table 2); body tilted 28° left (table 3); and finally with the subject seated erect (table 4). These 4 tests were performed in a dark environment on land and in water; for experiments in water subjects were equipped with self-contained underwater breathing apparatus.

Head alone tilted 45° left. To ensure the same angle of tilt with each subject, and to maintain this angle throughout the test, a head bracket attached to the seat in which the subject was seated tilted the head 45° to the left of the true vertical. From each of 5 subjects 8 judgments were obtained: 4 for the horizontal and 4 for the vertical. Two horizontal judgments, 1 with counterclockwise movement of the rod and the other with clockwise movement, were alternated with 2 vertical judgments, again 1 with counterclockwise and the other with clockwise movement.

Body tilted 42° left. Again, a clockwise and a counterclockwise horizontal judgment alternated with a clockwise and counterclockwise vertical judgment for a total of 8 judgments on each of 5 subjects.

Body tilted 28° left. On each trial the rod was initially displaced 28° rather than 90° from the true vertical or horizontal. For the

Table 4. ***Errors of subjects in perceiving vertical and horizontal in absence of visual field on land and in water: seated erect***

Subject	*Trial*	*Bar movement*	*Error (in degrees)*	
			On land	*In water*
JJ	1 Horizontal	Counterclockwise	1	5. 0
	2 Horizontal	Clockwise	1	2. 5
	3 Horizontal	Counterclockwise	1	3. 5
	4 Vertical	Clockwise	1	3. 0
	5 Vertical	Counterclockwise	1	4. 0
	6 Vertical	Clockwise	3	3. 0
JS	1 Horizontal	Counterclockwise	0	5
	2 Horizontal	Clockwise	1	8
	3 Horizontal	Counterclockwise	1	5
	4 Vertical	Clockwise	1	5
	5 Vertical	Counterclockwise	0	5
	6 Vertical	Clockwise	2	8
JTW	1 Horizontal	Counterclockwise	0. 5	3
	2 Horizontal	Clockwise	1. 0	4
	3 Horizontal	Counterclockwise	0. 5	4
	4 Vertical	Clockwise	1. 5	5
	5 Vertical	Counterclockwise	0. 5	5
	6 Vertical	Clockwise	0. 0	3
RK	1 Horizontal	Counterclockwise	1	4
	2 Horizontal	Clockwise	1	3
	3 Horizontal	Counterclockwise	4	2
	4 Vertical	Clockwise	4	5
	5 Vertical	Counterclockwise	5	3
	6 Vertical	Clockwise	0	3
ECD	1 Horizontal	Counterclockwise	0	3
	2 Horizontal	Clockwise	1	2
	3 Horizontal	Counterclockwise	0	3
	4 Vertical	Clockwise	0	4
	5 Vertical	Counterclockwise	1	5
	6 Vertical	Clockwise	1	5

first 4 trials (2 horizontal and 2 vertical), the rod was moved clockwise; for the last 4, counterclockwise, for a total of 8 judgments on each of 6 subjects.

Seated erect. In this control series, the rod was initially displaced 28°. Counterclockwise and clockwise movements alternated for 3

horizontal and then for 3 vertical judgments, for a total of 6 judgments on each of 5 subjects.

RESULTS

In tables 1–4 data are presented for each subject in each of the 4 tests. In table 5 the mean total error of judgments for each body position in and out of water is shown; each value is the mean total error for both horizontal and vertical judgments for the given condition, no regard being taken of the directions. When the subjects' performances in perceiving the horizontal and vertical with head alone tilted 45° were compared on land and in water, the difference was found to be highly significant ($t=5.01$, $P<0.01$), indicating a marked decrement in perception in water under the conditions of the experiment. Similarly, when the accuracy of the subject's perception with body tilted 42° left was compared on land and in water, the difference was again highly significant ($t=6.58$, $P<0.01$). Also, when performances while seated erect were compared on land and in water, the difference was highly significant ($t=13.36$, $P<0.01$).

Table 5. ***Mean total errors of judgments for each body position on land and in water****

Body position	*Mean total error (in degrees)*	
	On land	*In water*
Head alone tilted 45° left	3. 4	6. 8
Body tilted 42° left	2. 8	6. 8
Body tilted 28° left	4. 9	3. 3
Body erect	1. 2	4. 1

*Since the 2 types of judgments were similar, horizontal and vertical scores have been combined, with no account taken of the direction of the errors.

DISCUSSION

These results show that on land, in the erect seated position, even though no visual field is present, the horizontal and vertical can be established accurately, the mean error for the group being 1.2°. In contrast, subjects seated in the erect position, totally immersed in water and deprived of a visual field, manifested a total mean error of 4.1° in establishing the horizontal and the vertical. Tilting the head or body led to increased errors in judgment. With only the head tilted the total mean error was 3.4° on land, 6.8° in water.

With a 42° tilt of the body the total mean error was 2.8° on land, 6.8° in water. With the body tilted 28° left, an anomalous condition arose in which the total mean error on land (4.9°) was greater than in water (3.3°). In some individual cases, the errors produced by tilting the head or body were considerably larger than the average figures. The poorest mean score for horizontal or vertical tilt in each body position while the subject was immersed in water was as follows: Head alone tilted 45° left, 14°; body tilted 28° left, 8.3°; body tilted 42° left, 16.8°.

SUMMARY AND CONCLUSIONS

To determine the role of the labyrinth in sensing body position under subgravity conditions in the absence of peripheral visual cues, quantitative experiments were performed comparing perception of the horizontal and vertical on land and in water for several body positions. Under the conditions of the experiments, subjects manifested a significant decrement in perception of the horizontal and vertical when immersed in water in simulated subgravity conditions. Errors in judgment tended to be greater, both on land and in water, when the head or body was tilted than when subjects were seated erect.

These results suggest that when the body is upright, postural factors are adequate for judging the horizontal and vertical; but that when the body, or even the head alone, is tilted, these factors provide a less effective basis for judgment. In simulated subgravity conditions, with decreased proprioceptive input, perception of the horizontal and vertical is greatly impaired. During weightlessness in actual space flight, artificial gravity forces may be needed to ensure adequate human orientation.

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Medical Impairments and Military Effectiveness II

Performance and Disposition of Inductees Admitted to Sick Report: Plan of Study and Analysis of Results

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TO INCREASE MANPOWER RESOURCES during times of full mobilization, medical efforts, in the past, have been chiefly directed either to selective acceptance of persons with marginal medical impairments (that is, by lowering entry requirements) or to the medical rehabilitation and retention of trained soldiers acquiring impairments within the military service. In 1956 the surgeon general of the Army recognized the inadequacy of these measures alone in the conservation of manpower and made the following comments:

"If we do not assist in the classification of personnel, handicapped and ineffective men will be assigned to jobs beyond their capabilities and able-bodied men to the jobs which require lesser capabilities . . . . It is essential that we classify the physical, emotional and mental qualifications of the persons and the corresponding requirements of the job in a manner to facilitate proper assignments in the Army." [9]

There is little documentation in the literature concerning the exact relationship of designated medical impairments to specific military jobs or to duty performance. If lowering of entry standards is anticipated during periods of national emergency, it seems desirable that we accumulate more information concerning the past utilization of persons with medical impairments now causing major manpower

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From Walter Reed Army Institute of Research, Washington, D.C. This is the second article in the authors' four-part study of "Medical Impairments and Military Effectiveness." Part I appeared in the June issue of this *Journal*.

losses and the military effectiveness of such persons. Such data will have limited value in predicting the performance of the individual soldier. It should, however, guide policy makers with regard to groups of persons with a given medical impairment.

Inasmuch as the major manpower problems are associated with the procurement and utilization of enlisted personnel inducted through Selective Service channels, it is the primary purpose of parts II, III, and IV of this report to describe a study based on the records of a group of inductees who were admitted to Army medical treatment facilities with certain medical impairments: (1) to appraise the characteristics and accomplishments of those who successfully completed their 2-year military obligation and the military jobs in which they served; and (2) to review the factors responsible for the failure of those who did not complete their obligated period of military service.

PLAN OF STUDY

Selection of Samples

Three main samples were employed for the study:

1. *Baseline sample.* This consists of 710 Army of the United States (AUS) enlisted men (inductees) who received honorable discharges (not for medical reasons) in 1957 or early 1958. This sample, analyzed in part I of this report, is used in parts II, III, and IV to provide a rough yardstick against which to measure the performance, sick-call rates, and similar factors of soldiers in the disease entity samples.

2. *OTSG admissions for selected disease entities.* The second sample is based on machine punch cards prepared by the Medical Statistical Division, OTSG, Department of the Army, for Army enlisted men admitted to hospital or quarters with selected disease entities in 1955 or held over in hospital or quarters status in 1955 from the preceding year. The data on Regular Army and AUS enlisted men in these categories are presented in tables 19 and 21 through 30.

3. *Disease entity samples.* The individual case studies discussed in parts II, III, and IV of this report consist of Army of the United States (AUS) enlisted men (inductees) whose service numbers were initially obtained from OTSG admission cards described above, and for whom adequate medical and administrative records were available from the U.S. Army Records Center in St. Louis. For analytic purposes they are divided into "successfuls" (soldiers who successfully completed their obligated period of military service following return to duty from hospital or quarters) and "unsuccessfuls" (soldiers who received discharges for medical reasons after release from hospital or quarters).

Disease Entities

The specific medical impairments studied include perennial bronchial asthma, chronic otitis media, epilepsy, duodenal ulcer, knee joint

injuries, rheumatic disease (rheumatic fever or rheumatic heart disease), herniated nucleus pulposus, anxiety reaction, abdominal hernia, pilonidal sinus and varicose veins of the leg. These medical conditions are now responsible for major manpower losses in peacetime as well as during mobilization periods, either through rejections at Armed Forces examining stations, through hospitalization while in the service, or through disability separations. Therefore, men with these impairments constitute an important military manpower potential if further lowering of entry requirements is indicated.

Procedure

The Department of Physical Standards Research, Walter Reed Army Institute of Research (WRAIR), requested the Medical Statistics Division, Office of the Surgeon General, Department of the Army, to furnish duplicate machine record data cards on all active duty personnel who, in 1955, were admitted to hospital or quarters status or who were held over from the preceding year with one of the disease entities studied. The data cards furnished by the Medical Statistics Division represented their routine 50 percent random sample of soldiers who were returned to duty and their routine 100 percent sample of all other dispositions, such as separations, duty pending separation, permanent or temporary disability retirement. The individual case studies were limited to the records of Army of the United States (AUS) enlisted men (inductees) sick in hospital or quarters in 1955. The soldier concerned would thus have had the opportunity to complete his obligatory tour of military service, usually 2 years, and individual medical records would then have reached the files at the U.S. Army Records Center, St. Louis, Missouri. These studies did not include soldiers treated exclusively on an outpatient basis except for a few who had been "carded for record only" in connection with disability separation proceedings or similar actions.

Because of the great variations in the length of time a Regular Army enlisted man may choose to remain in service, a high proportion of individual medical records on such men would have been unattainable without undue effort and expense. Therefore, the use of the machine record cards pertaining to Regular Army enlisted men sick in hospital or quarters in 1955 was limited to comparing their dispositions from hospital or quarters with dispositions of the AUS enlisted men in the same year.

Lists of service numbers were prepared from the admission data cards on the cases included in the sample for the study of a given disease entity and sent to the U.S. Army Records Center.

The following information was abstracted for each inductee in the selected sample and forwarded to the Department of Physical Standards Research for analysis: race, age, marital status, civilian education, mental group based on Armed Forces Qualification Test scores, military job (military occupational specialty) performed longest, months served in military job held longest, days lost for medical reasons, sick-call visits, area in which military duty performed, branch of service to which assigned, final grade held, decorations received, conduct ratings, efficiency ratings, record of courts-martial proceedings, time lost for disciplinary reasons, number of transfers, type of discharge, copies of entry and separation medical examinations, and copies of the narrative summary of the individual medical record and outpatient treatments.

All individual medical records and medical examination reports were evaluated by a military physician. The abstracted data were coded at WRAIR and entered on machine punch cards. Statistical tabulations were then made and compared with similar statistics on the baseline sample of 710 inductees described in part I of this report.[10]

Table 5. ***Sampling method according to disease entities in 3,097 inductees***

Method of selection	*Bronchial asthma*	*Chronic otitis media*	*Epilepsy*	*Duodenal ulcer*	*Knee injury*	*Rheumatic disease*	*Herniated nucleus pulposus*	*Anxiety reaction*	*Abdominal hernia*	*Pilonidal sinus*	*Varicose veins*
Total OTSG cards for AUS* hospital or quarters cases	449	294	202	596	904	518	242	339	1,646	1,065	299
Cases for which abstracts requested											
Duty dispositions	†151	164	69	304	††285	151	104	192	†††488	*†407	†247
Disability separations	92	61	53	144	135	194	62	98	26	14	9
Miscellaneous dispositions	–	–	–	47	69	18	51	–	26	18	1
Total abstracts requested	243	225	122	495	489	363	217	290	540	439	257
Total abstracts received**	220	205	112	442	456	320	203	260	476	385	229
Abstracts not used***	6	10	9	29	45	14	6	43	21	17	11
Cases used in study											
Successful soldiers	111	134	49	266	275	133	125	128	437	356	210
Unsuccessful soldiers	103	61	54	147	136	173	72	89	18	12	8
Total cases used	214	195	103	413	411	306	197	217	455	368	218

*Since each diagnosis and each admission of the individual is represented by a separate punch card, the number of admission cards exceeds the number of individuals involved.

**In some cases records requested were lost, unavailable, or could not be located because of erroneous service numbers.

***See text.

† Limited to single diagnosis.

†† 50% subsample of carded admissions.

††† 40% subsample of carded admissions having a single diagnosis of abdominal hernia.

*† 50% subsample of carded admissions having a single diagnosis of pilonidal sinus.

Of the cases on the original rosters approximately 10 percent were dropped from the study because their records could not be located. Eliminated from detailed consideration were those inductees who had elected to remain in the Regular Army, those who received early honorable discharges for compassionate reasons, those who received neither medical nor honorable discharges, those whose medical discharges were for reasons other than the diagnoses under study, and those whose records did not provide adequate information. These eliminations were made in order to confine the study to readily available records of clear-cut cases of success or failure among 2-year inductees with the relevant medical condition. The method of arriving at the final 3,097 cases selected for study is summarized in table 5.

The test of statistical significance utilized throughout this report is the chi-square test as described by Batson.[11]

In designing the study procedure the Department of Physical Standards Research limited its initial efforts to those data which could be assembled and organized by a small staff with a moderate budget. Although immediately usable results constituted the main purpose of the research program, a secondary objective was to provide a broad background of experience upon which to base more detailed and focused research on the effective military utilization of physically limited personnel. In addition to commenting on the empiric results of the initial investigation, therefore, the present report includes an assessment of the limitations of the work completed and suggestions for consideration in the design of any further investigations.

Limitations

Of the baseline sample of 710 AUS enlisted men, 319 were admitted to hospital or quarters for some cause at least once during the 2 years they were in the Army. Although this sample was drawn by a method that was administratively convenient rather than rigorously random in design, no known bias influenced the selection of cases from the files of the U.S. Army Records Center, nor does inspection of the distributions of background characteristics among the sample group reveal any marked deviation from what one would logically expect. The nature of the sample, however, is such that it cannot be considered representative of the entire Army enlisted population nor even of enlisted men of comparable youth and length of service. The motivations and reactions to illness manifested by Army volunteers are likely to be different in many cases from those of men who enter the service solely because of Selective Service. Furthermore, since the inductees in the

baseline sample served in the Army between late 1955 and early 1958, there is a possibility that the general situation they encountered differed in some respects from the situation encountered by those in the disease entity samples, who served between 1953 and 1957.

With respect to the various disease entity samples studied, it is imperative to keep in mind that the subjects were selected from hospital or quarters *admissions* and, therefore, cannot be considered representative of other inductees with the same medical condition who were treated exclusively on an outpatient basis or who perhaps never even went on sick call. Unfortunately, it is impossible at present to estimate with any confidence what percentage of all inductees having a given condition, such as asthma, are ever admitted to hospital or quarters for that condition during their time in the Army. Furthermore, one may logically expect certain conditions like herniated nucleus pulposus to require some hospitalization in almost all cases, whereas for other conditions, such as otitis media, only a relatively small proportion may require hospitalization. In this respect, the samples examined in these studies may differ considerably from one another in representing the over-all inductee population with a given disease.

Still another important difference between the disease entity samples results from the great variation in admission rates for the various disease entities. For some disease entities with a large number of admissions, sufficient cases for study could be obtained from admissions with a specific disease entity as a *single diagnosis;* for other disease entities *primary diagnosis* had to be used. In still other conditions, the admissions were so few in number that all cases had to be included in the sample, even when the diagnosis in question was not the main cause of admission. These latter cases were discarded, however, if the primary conditions were more severe or would be expected to affect performance adversely over and above the effects of the medical condition being studied.

RESULTS

As already mentioned, the cases selected for study have been divided for purposes of analysis into a "successful" group (2,224 inductees who completed their obligatory 24-month period of military service and received routine honorable discharges *not* for disability) and an "unsuccessful" group (873 inductees who were retired or separated for disability) and did not complete their obligatory period of military service.

Inductees who completed their military obligation (successful soldiers). The basic data for this portion of the study were the medical and personnel records pertaining to 2,224 inductees who either were admitted to Army medical treatment facilities in 1955 or were held over in hospital or quarters status from the previous year with one of the diagnoses previously listed, and who subsequently completed their 2-year service period with honorable discharges. Selected data on these successful inductees follow. Additional observations are included in the discussions of each disease entity in parts III and IV of this study.

Age. All soldiers in the successful group were between 18 and 28 years of age upon entering the Army, with 85 to 90 percent of those in each disease entity sample between 19 and 25 years of age.

Race. No unusual racial distribution was apparent among the disease entities studied. Proportional distribution by race approximated that of Army inductees in general.

Marital status. Most soldiers (60 to 65%) were single, 30 to 34 percent were married, and 1 to 3 percent were separated, widowed, or divorced. No unusual marital distribution was noted for any disease entity studied.

MOS held for longest period and military branch assignment. Soldiers in the "successful" sample served in military occupational specialties with all branches of the Army (table 6).

Table 6. ***Type MOS held longest by baseline sample of inductees and by samples of successful inductees sick in hospital or quarters in 1955 with selected diagnoses.* Percentage distribution***

Military occupational specialty (MOS) group	*Baseline sample*			*Successful inductees according to medical diagnoses*										
	Total baseline sample (708)	*No admissions to hospital or quarters (389)*	*One or more admissions ($19)*	*Bronchial asthma (111)*	*Chronic otitis media (134)*	*Epilepsy (49)*	*Duodenal ulcer (261)*	*Knee injury ($75)*	*Rheumatic disease (128)*	*Herniated nucleus pulposus (125)*	*Anxiety reaction (187)*	*Abdominal hernia (436)*	*Pilonidal sinus (356)*	*Varicose veins (210)*
Combat	34	34	34	24	25	23	33	35	23	30	32	27	27	26
Electronic	9	9	9	7	6	6	6	6	6	4	2	5	5	7
Electrical maintenance	5	5	5	5	–	2	7	8	7	6	5	8	8	4
Precision maintenance	1	1	1	3	4	0	1	1	1	2	**	1	2	3
Military crafts	5	5	5	9	7	10	7	2	7	5	6	7	4	9
Motor maintenance	10	10	11	10	21	10	16	7	13	10	10	14	8	14
Clerical	19	17	15	21	17	22	14	13	24	27	21	16	24	15
Graphics	1	1	1	1	3	–	**	16	1	**	5	2	1	2
General technical	11	13	14	15	13	25	13	1	17	11	17	15	15	17
Special assignments	5	5	5	5	4	2	3	11	1	5	2	5	6	3
Total (%)	100	100	100	100	100	100	100	100	100	100	100	100	100	100

*Subjects for whom MOS information was not obtainable have been omitted.
**Fewer than ½ of 1%.

Table 7. ***Areas where longest-held MOS was performed by baseline sample of inductees and by samples of successful inductees sick in hospital or quarters in 1955 with selected diagnoses.* Percentage distribution***

Areas where MOS was performed	*Baseline sample*			*Successful inductees according to medical diagnoses*										
	Total baseline sample (709)	*No admissions to hospital or quarters (391)*	*One or more admissions (318)*	*Bronchial asthma (111)*	*Chronic otitis media (135)*	*Epilepsy (49)*	*Duodenal ulcer (265)*	*Knee injury (876)*	*Rheumatic disease (132)*	*Herniated nucleus pulposus (122)*	*Anxiety reaction (187)*	*Abdominal hernia (457)*	*Pilonidal sinus (566)*	*Varicose veins (809)*
U. S. only	38	36	34	46	43	38	43	51	43	55	35	43	46	49
Overseas only	29	30	32	24	25	22	24	40	33	36	49	40	42	37
U. S. and overseas	33	34	34	30	32	40	33	9	24	9	16	17	12	14
Total (%)	100	100	100	100	100	100	100	100	100	100	100	100	100	100

*Subjects for whom relevant information was not obtainable have been omitted.

Area military service performed. "Successful" soldiers with the various medical conditions studied served both in the continental United States and in overseas areas (table 7).

Pre-service history of medical conditions. The proportions of successful inductees who reported a history of the given medical conditions prior to their service varied appreciably with the different disease entities (table 8).

Military accomplishments, comparison with baseline sample. In judging the

Table 8. ***Successful inductees with civilian history of given medical conditions at entry into Army or after admission to AMEDS treatment facilities.* Percentage distribution***

History of specified disease prior to service	*Successful inductees according to medical diagnoses*										
	Bronchial asthma (111)	*Chronic otitis media (134)*	*Epilepsy (49)*	*Duodenal ulcer (261)*	*Rheumatic disease (133)*	*Herniated nucleus pulposus (125)*	*Knee injury (875)*	*Anxiety reaction (187)*	*Abdominal hernia (457)*	*Pilonidal sinus (566)*	*Varicose veins (810)*
Given at preinduction examination	55	54	14	31	20	7	30	33	47	33	39
Given at admission to AMEDS treatment facilities	19	7	59	5	1	13	5	9	–	67	3
No history prior to service (incurred in line of duty)	26	39	27	64	79	80	65	58	53	–	58
Total (%)	100	100	100	100	100	100	100	100	100	100	100

*Subjects for whom relevant information was not obtainable have been omitted.

Table 9. ***Final grade held by baseline sample of inductees and by samples of successful inductees sick in hospital or quarters in 1955 with selected diagnoses.* Percentage distribution***

Final grade held	*Baseline sample*			*Successful inductees according to medical diagnoses*										
	Total baseline sample (710)	*No admissions to hospital or quarters (391)*	*One or more admissions (319)*	*Bronchial asthma (111)*	*Chronic otitis media (134)*	*Epilepsy (49)*	*Duodenal ulcer (266)*	*Knee injury (275)*	*Rheumatic disease (138)*	*Herniated nucleus pulposus (125)*	*Anxiety reaction (127)*	*Abdominal hernia (437)*	*Pilonidal sinus (356)*	*Varicose veins (210)*
E-1 and E-2 (Pvt)	4	2	6	16	6	12	10	8	1	6	10	6	5	7
E-3 (Pfc)	34	32	36	42	43	51	42	51	45	42	41	39	38	37
E-4 (Cpl, Sp 3)	60	62	57	41	51	37	46	38	53	53	47	46	54	53
E-5 (Sgt, Sp 2)	2	3	1	1	–	–	2	3	1	5	3	2	3	3
Total (%)	100	100	100	100	100	100	100	100	100	100	100	100	100	100

*Subjects for whom final grade held was not obtainable have been omitted.

quality of a given soldier's performance, the unit commander is likely to be influenced consciously or otherwise by a number of considerations, such as the frequency with which he goes on sick call, his disciplinary record, his motivation for service, and his ability to get along with others. The commander's over-all estimate of the soldier's performance and ability will presumably be reflected in the conduct and efficiency ratings given the man, in the rapidity with which he is promoted, and in his decorations and awards such as the Good Conduct medal. Many factors that might influence the unit commander's estimate of the soldier's worth are intangible or unavailable in the personnel

Table 10. ***Good Conduct medals received by baseline sample of inductees and by samples of successful inductees sick in hospital or quarters in 1955 with selected diagnoses.* Percentage distribution***

Good Conduct medal awarded	*Baseline sample*			*Successful inductees according to medical diagnoses*										
	Total baseline sample (710)	*No admissions to hospital or quarters (391)*	*One or more admissions (319)*	*Bronchial asthma (111)*	*Chronic otitis media (134)*	*Epilepsy (49)*	*Duodenal ulcer (266)*	*Knee injury (275)*	*Rheumatic disease (138)*	*Herniated nucleus pulposus (125)*	*Anxiety reaction (127)*	*Abdominal hernia (437)*	*Pilonidal sinus (356)*	*Varicose veins (210)*
Yes	65	66	64	51	52	56	61	56	60	67	55	63	64	57
No	35	34	36	49	48	44	39	44	40	33	45	37	36	43
Total (%)	100	100	100	100	100	100	100	100	100	100	100	100	100	100

*Subjects for whom information regarding receipt of a Good Conduct medal was not obtainable have been omitted.

records. Certain relevant data are available, however. These permit the following comparisons to be made between the characteristics and accomplishments (military performance) of the sample of "successful" soldiers, admitted to treatment facilities with the listed medical conditions, and those of the baseline sample of inductees who also completed their 2-year military service successfully:

(1) *Final grade held.* Most commanders will promote their more competent soldiers faster than their less competent ones (table 9).

(2) *Good Conduct medal.* All enlisted personnel have an equal opportunity to be awarded the Good Conduct medal if their service conduct has been acceptable. Since most commanders will not award a Good Conduct medal to the malingerer, the disciplinary problem, or the soldier whose motivation and attitude have been markedly poorer than average, this variable has been chosen as a measure of military performance. Appreciable variations existed in the frequency of Good Conduct medal awards among the successful soldiers in the specified disease entity groups (table 10). The reasons for these variations cannot be clearly ascertained from the present data. It seems conceivable, however, that certain medical conditions, especially if they require surgery or prolonged hospitalization, may impress the line unit commander as more "real" and "legitimate" than other medical conditions. If so, the commander may tend to withhold the Good Conduct medal from those men of his unit whom he perhaps views as "weak sisters" or "sick call

Table 11. ***Duty days lost for medical reasons* by baseline sample of inductees and by samples of successful inductees sick in hospital or quarters in 1955 with selected diagnoses. Percentage distribution***

Duty days lost for medical reasons	*Baseline sample*			*Successful inductees according to medical diagnoses*										
	Total sample (710)	*No admissions to hospital or quarters (391 = 55%)*	*One or more admissions (319)*	*Bronchial asthma (111)*	*Chronic otitis media (154)*	*Epilepsy (49)*	*Duodenal ulcer (266)*	*Knee injury (276)*	*Rheumatic disease (135)*	*Herniated nucleus pulposus (125)*	*Anxiety reaction (188)*	*Abdominal hernia (437)*	*Pilonidal sinus (356)*	*Varicose veins (210)*
1–10	–	–	70	37	41	21	7	10	5	8	45	8	23	14
11–20	–	–	15	22	11	21	11	9	4	8	19	23	15	32
21–30	–	–	6	10	12	10	14	6	5	7	8	23	16	22
31–40	–	–	2	3	4	12	10	7	5	3	8	17	10	15
41–50	–	–	2	5	9	4	10	9	4	3	4	12	4	7
51–60	–	–	1	2	5	8	7	9	8	6	3	4	5	2
61–70	–	–	1	5	2	10	7	5	11	2	2	2	6	1
71–80	–	–	1	3	2	2	5	8	5	5	2	2	4	1
81–90	–	–	1	1	4	0	4	4	6	2	1	2	2	1
91 or more	–	–	1	12	10	12	25	33	47	56	8	7	15	5
Total (%)	–	–	100	100	100	100	100	100	100	100	100	100	100	100
Median days lost for medical reasons	–	–	7	16	18	30	49	61	85	105	14	18	27	22

*"Duty days lost for medical reasons" is defined as total number of days spent in hospital, quarters, convalescent leave, or medical evacuation pipeline during military service.

Table 12. ***Total times on sick call for baseline sample of inductees and for samples of successful inductees sick in hospital or quarters in 1955 with selected diagnoses.* Percentage distribution***

Total times on sick call	*Baseline sample*			*Successful inductees according to medical diagnoses*										
	Total baseline sample (710)	*No admissions to hospital or quarters (391)*	*One or more admissions (319)*	*Bronchial asthma (111)*	*Chronic otitis media (154)*	*Epilepsy (49)*	*Duodenal ulcer (266)*	*Knee injury (275)*	*Rheumatic disease (139)*	*Herniated nucleus pulposus (125)*	*Anxiety reaction (129)*	*Abdominal hernia (435)*	*Pilonidal sinus (355)*	*Varicose veins (210)*
0	12	19	5	3	1	0	2	2	3	1	1	1	1	2
1–5	47	51	43	21	19	25	20	16	32	19	16	32	28	17
6–10	23	19	27	20	30	25	27	24	28	23	22	29	28	25
11–15	9	7	11	22	20	18	18	24	17	34	15	16	19	24
16–20	5	3	7	9	12	12	12	11	9	10	14	10	12	14
21–25	3	1	4	9	7	10	8	8	4	4	13	7	5	8
26–30	**	–	1	4	4	6	6	8	4	6	4	1	**	3
31–40	1	–	1	9	5	4	5	5	3	2	7	2	2	6
41 or more	**	–	1	3	2	0	2	2	0	1	8	2	5	1
Total (%)	100	100	100	100	100	100	100	100	100	100	100	100	100	100
Median times on sick call	4	3	5	12	10	11	11	13	8	11	14	9	9	11

*Subjects for whom number of times on sick call was not obtainable have been omitted.
**Fewer than ½ of 1%.

riders" because they have conditions such as asthma or otitis media that do not seem very "real" or "serious" to him as a layman.

It is worth pointing out that as far as the Good Conduct medal is concerned, the total group of inductees in the combined disease entity samples was not significantly different from the baseline sample group admitted to hospital or quarters at least once.

(3) *Duty days lost for medical reasons.* For the purpose of this analysis, duty days lost for medical reasons are the total number of days for which available records show that the subject was not present for duty because of being in hospital, on a quarters status, on convalescent or sick leave, or in the medical evacuation pipeline during his military service. A comparison of the duty days lost for medical reasons by successful soldiers with the medical conditions under study and by those inductees in the baseline sample who had at least one admission to hospital or quarters shows that the baseline sample had a much smaller number of duty days lost for medical reasons (table 11).

(4) *Times on sick call.* Although most soldiers appear on sick call at some time during their 2-year period of military service, the successful inductees with the medical conditions under study had many more sick-call visits than did successful inductees in the baseline sample (table 12). Even when compared with only those soldiers in the baseline sample who had been admitted to hospital or quarters at least once during their term of service, the successful inductees with the designated medical conditions made appreciably more sick call visits.

Table 13. ***Mental groups among baseline sample of inductees and among samples of successful inductees sick in hospital or quarters in 1955 with selected diagnoses. Percentage distribution***

Mental group	Baseline sample*			Successful inductees according to medical diagnoses										
	Total baseline sample (708)	No admissions to hospital or quarters (390)	One or more admissions (318)	Bronchial asthma (111)	Chronic otitis media (134)	Epilepsy (49)	Duodenal ulcer (266)	Knee injury (276)	Rheumatic disease (135)	Herniated nucleus pulposus (185)	Anxiety reaction (128)	Abdominal hernia (437)	Pilonidal sinus (366)	Varicose veins (210)
I (High AFQT scores)	10	9	11	11	6	6	6	7	10	10	8	9	12	9
II	26	26	26	27	25	24	14	31	31	31	22	29	32	26
III	33	34	32	29	28	36	31	28	28	28	37	30	31	30
IV	29	29	29	25	40	32	41	30	30	30	28	29	22	30
Administrative acceptees	2	2	2	8	1	2	8	4	1	1	5	3	3	5
Total (%)	100	100	100	100	100	100	100	100	100	100	100	100	100	100

*Subjects for whom relevant information was not obtainable have been omitted.

Mental groups. All persons who enter military service receive from personnel psychologists a group of mental or intellectual questions (Armed Forces Qualification Test) as an integral part of the pre-induction processing. In 100 questions divided into 4 groups, the examinee is tested on word meaning, arithmetical reasoning, forms and positions, and mechanical ability. The passing score since 1951 has been equivalent to the 10th percentile, except that certain procedures have been established for further testing those who

Table 14. ***Type of disability separation received by unsuccessful inductees according to selected diagnoses. Percentage distribution****

Type of separation	Unsuccessful inductees according to medical diagnoses										
	Bronchial asthma (108)	Chronic otitis media (61)	Epilepsy (54)	Duodenal ulcer (147)	Knee injury (156)	Rheumatic disease (178)	Herniated nucleus pulposus (78)	Anxiety reaction (89)	Abdominal hernia (18)	Pilonidal sinus (18)	Varicose vein s (8)
Separation without severance pay	92	100	99	76	90	57	65	98	(15)	(11)	(7)
Separated with severance pay	4	0	1	23	8	33	3	1	–	(1)	–
Temporary disability retirement	4	0	0	1	1	8	21	0	(2)	–	–
Permanent disability retirement	0	0	0	0	1	2	11	1	(1)	–	(1)
Total (%)	100	100	100	100	100	100	100	100	–	–	–

*Figures in parentheses are numbers of cases rather than percentages.

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Table 15. ***Length of service at time of disability discharge from Army of inductees sick in hospital or quarters in 1955 according to selected diagnoses. Percentage distribution****

Length of service at time of disability discharge (in months)	*Unsuccessful inductees according to medical diagnoses*										
	Bronchial asthma (105)	*Chronic otitis media (61)*	*Epilepsy (54)*	*Duodenal ulcer (147)*	*Knee injury (186)*	*Rheumatic disease (173)*	*Herniated nucleus pulposus (72)*	*Anxiety reaction (89)*	*Abdominal hernia (18)*	*Pilonidal sinus (12)*	*Varicose veins (8)*
Less than 1	5	21	2	1	4	1	7	0	(4)	(3)	(3)
1 to 2	9	21	7	5	9	8	6	5	(1)	(2)	(2)
2 to 3	11	8	7	13	17	9	12	12	(2)	(1)	–
3 to 6	19	30	28	27	22	19	17	42	(2)	(3)	(1)
6 to 9	20	12	26	15	21	14	12	19	(3)	–	–
9 to 12	6	5	15	11	11	13	7	12	(2)	(1)	–
12 to 18	18	3	9	9	8	14	10	10	(2)	(1)	(1)
18 to 24	6	0	4	12	4	10	12	0	(2)	(1)	–
24 or more	6	0	2	7	4	12	17	0	–	–	(1)
Total (%)	100	100	100	100	100	100	100	100	–	–	–

*Figures in parentheses are numbers of cases rather than percentages.

fail the mental test. If the failures are found qualified on additional testing and personal interview, they are designated as "administrative acceptees" despite their grades as mental group V. Examinees who make the higher scores are mental group I. Mental groups II, III, and IV are composed of examinees who made intermediate scores. No significant differences were found between the frequency distributions of mental groups in the baseline sample and those of "successful" inductees with the specified medical conditions (table 13).

Inductees who failed to complete military obligation (unsuccessful soldiers). The personnel and medical records pertaining to 873 inductees who were admitted to Army medical treatment facilities and subsequently separated for disability were studied with a view to determining the factors responsible for disability separations. An attempt was made to collect the same information on this group as was collected on the "successful" group with designated medical conditions. In many instances this was not meaningful: for example, a soldier who was in the military service less than 1 month had no opportunity to be promoted or to receive a Good Conduct medal. Within these limitations, data have been collected as follows:

Type of disability separation. Most of the soldiers who were separated for disability were separated for conditions existing prior to service and not aggravated by service experience (EPTS) (table 14). These men, therefore,

are not entitled to any disability compensation from the Army. However, it is entirely possible that some of those separated for disability without compensation will subsequently be entitled to compensation from the Veterans Administration, inasmuch as an independent determination of compensation eligibility is made by that agency. Smaller percentages were separated for disability with severance pay—a lump payment of 2 months' basic pay of the rank held at the time of separation, multiplied by the number of years of active service to which the member is entitled, but not to exceed a total of 2 years' basic pay. Most inductees separated with severance pay received amounts ranging from $172 to $344. The number of permanent and temporary disability retirements was negligible except for men retired with rheumatic disease or herniated nucleus pulposus.

Separations by length of service and place. A significant percentage of separations occurred during the first 6 months of military service (table 15), mainly at basic or advanced combat training centers. This relationship will be discussed further by disease entity.

Age, race, marital status. These factors seemed of no importance in determining why an inductee with one of the listed disease entities was unsuccessful.

Courts-martial, time lost for disciplinary reasons, conduct ratings, efficiency ratings. Comparisons made of the frequency distributions of these factors for the "unsuccessful" and "successful" samples and the baseline sample did not show any important differences.

Relationship of civilian education to successful completion of category. The inductee with bronchial asthma, duodenal ulcer, epilepsy, chronic otitis media, or rheumatic disease who has graduated from high school is more likely to complete his period of military service than is the inductee who did not complete

Table 16. ***Relationship between education and successful completion of military obligation among sample of Army inductees admitted to hospital or quarters in 1955 with selected diagnoses. Percentage distribution***

Completion of military obligation	Asthma		Chronic otitis media		Epilepsy		Duodenal ulcer		Rheumatic disease	
	Did not complete high school (87)	High school graduate* (188)	Did not complete high school (97)	High school graduate* (98)	Did not complete high school (57)	High school graduate* (46)	Did not complete high school (231)	High school graduate* (188)	Did not complete high school (110)	High school graduate* (186)
Successful**	41	61	60	78	28	71	60	70	35	48
Unsuccessful***	59	39	40	22	72	29	40	30	65	52
Total (%)	100	100	100	100	100	100	100	100	100	100
Significance by chi-square	$P=<.01$		$P=<.01$		$P=<.001$		$P=<.05$		$P=<.05$	

*Includes men with college education.
**Completed normal 2-year period of service with honorable discharge.
***Separated for medical condition indicated.

Table 17. ***Relationship between recorded history of selected diagnosis at preinduction medical examination and successful completion of military obligation. Percentage distribution***

Completion of military obligation	*Recorded history*											
	Ear trouble		*Indigestion*		*Knee trouble*		*Rheumatism*		*Back trouble*		*Emotional trouble*	
	yes	no	yes	no	yes	no	yes	no	yes	no	yes	no
Successful	59	86	56	69	50	78	33	46	32	80	47	67
Unsuccessful	41	14	44	31	50	22	67	54	68	20	53	33
Total (%)	100	100	100	100	100	100	100	100	100	100	100	100
Number in sample	123	72	144	261	164	265	78	224	57	131	89	125
Significance by chi-square	$P=<.01$		$P=<.05$		$P=<.001$		$P=<.05$		$P=<.001$		$P=<.01$	

high school (table 16). This relationship was not statistically significant however, for knee joint injuries, herniated nucleus pulposus, and anxiety reaction. The relationship of civilian education to completion of category for abdominal hernia, pilonidal sinus, and varicose veins could not be examined because the study samples contained too few "unsuccessful" soldiers with these disease entities.

Relationship of recorded history and successful completion of category. A comparison was made of the relationship between recorded history of the disease entities studied, as made at the preinduction medical examination, and successful completion of military obligation (table 17). Men who gave a history of otitis media, duodenal ulcer, back trouble (herniated nucleus pulposus), rheumatic fever or rheumatic heart disease, emotional trouble (anxiety reaction), or knee trouble (derangement of knee, injury to cartilage of knee joint) were less likely to be successful than men with no such history noted at entry. This relationship was not significant for bronchial asthma and epilepsy; it could not be tested on the hernia, varicose vein, and pilonidal sinus cases studied because of the small number of unsuccessful soldiers with these conditions.

(Part III of this article will appear in the August issue. All references will be found at the end of part IV, in the September issue.)

THE SLOPPY EXPERIMENT

Nothing could be more unethical than a sloppy experiment on a human subject.—WALTER MODELL: The Ethical Obligations to the Nonsubject. (Editorial) *Clinical Pharmacology and Therapeutics*, March-April 1960.

Case for Diagnosis

MAJOR CLAUDE W. DELIA, MC, USA

ILLUSTRATED is the heart in situ with the pericardial sac opened of a 61-year-old white man who died in coma 37 months after cystectomy and bilateral ureterosigmoidostomy for carcinoma of the urinary bladder.

Diagnosis?

Please turn to page 812

From Armed Forces Institute of Pathology. This month's Case for Diagnosis is AFIP Accession No. 561370, contributed by Walter Reed General Hospital, Washington, D.C.

Medical Museum

Claude Bernard's Operating Table

HELEN R. PURTLE

DR. CLAUDE BERNARD, an eminent French physiologist who in 20 years accomplished more in the field of experimental physiology than all his predecessors, is today considered the founder of experimental medicine. Born in 1813, he entered the School of Medicine

Figure 1. Dr. Claude Bernard, from a medal struck in his honor in 1913.

From the Medical Museum of the Armed Forces Institute of Pathology, Washington, D.C.

in the French Academy, Paris, in 1832. There he studied under François Magendie, celebrated physiologist of the time, in the laboratory of the Collège de France. His 14 published volumes on *Lessons on Diabetes and Animal Glycogenesis* made him an acknowledged authority in the field of physiology. His *Introduction to the Study of Experimental Medicine* is one of the classics of medical science.

The Medical Museum of the Armed Forces Institute of Pathology includes in its exhibits an experimental operating table made for

Figure 2. Experimental operating table used by Claude Bernard in the physiology laboratory of the Collège de France.

François Magendie in 1831. He and Claude Bernard, as his assistant, used this table for 30 years in the physiology laboratory of the Collège de France.

On this table Magendie demonstrated the roots of the spinal nerves, which he discovered in 1822. On this table Claude Bernard discovered the function of the spinal accessory nerves in 1844, the glycogenic function of the liver and the digestion of fats by the pancreas in 1848, and the influence of the sympathetic nervous system upon animal heat in 1851.

Bernard gave the table to Dr. Austin Flint, Jr., a founder of Bellevue Hospital Medical College, New York City, in 1861 when he became professor of physiology there. Two years before Dr. Flint left Bel-

levue Hospital for Cornell Medical School, in 1898, he presented this historic table to the Medical Museum.

The sturdy oak table is 38 inches long, 27-½ inches wide, and 32 inches high. Multiple round holes on the top of the table, approximately one-half inch in diameter, were apparently designed for securing the experimental animal and for inserting the testing apparatus.

Case for Diagnosis—continued from page 809

Diagnosis and Discussion

Fibrinous pericarditis (uremic) in bilateral hydronephrosis and pyelonephritis. Uremic pericarditis is said to occur in about 18 percent of patients with acute renal failure, and in 51 percent of those dying with chronic renal failure.

Reference. Wacker, W. and Merrill, J. P.: Uremic pericarditis in acute and chronic renal failure. *J.A.M.A.* 156: 764–765, Oct. 23, 1954.

BEE STINGS

Some advice can be given to patients who are hypersensitive to bee venom regarding measures that can be taken to avoid and alleviate bee stings. . . . Brown, black, or red clothes with a worsted or flannel texture, bright objects such as bright jewelry, and the odor of perspiration appear to cause bees to sting more readily. Swatting or swinging at bees will increase the likelihood of being stung, and a standing person is more likely to be stung than a person who is sitting or lying down. Consequently, if a person is approached by a few bees, sitting or lying quietly is advisable, and attacking bees may be discouraged by crawling through bushes or under large objects. The explanation for some of these observations may be that any appearance or activity of a human which simulates that of a bear may stimulate a bee to sting, since the bear is a natural enemy of the bee. After being stung, the victim immediately should attempt to remove the stinger by scraping with the fingernail, since contraction of the stinging apparatus continually injects venom into the tissue. Grasping of the stinger will only force more venom into the wound.—ROY PATTERSON: Allergic Emergencies. *The Journal of the American Medical Association*, January 23, 1960.

Did you enter our Poll of Readers?
See the June issue

Case Reports

Paroxysmal Atrial Tachycardia and Heart Failure in Infancy

MAJOR EDWARD J. TOMSOVIC, MC, USA
CAPTAIN MALCOLM MC LEAN, MC, USA

MANY INFANTS dying of congestive heart failure have anatomic abnormalities of the heart, only a few of which are amenable to treatment.[1] However, a significant number of infants in congestive heart failure may respond dramatically to treatment. Chief among the causes of heart failure in this group is supraventricular tachycardia.[2] Swift recognition and treatment of supraventricular tachycardia may be lifesaving. The following case report illustrates salient features of this disorder as encountered in infancy, and delineates important aspects of its management.

CASE REPORT

A 9-day-old white male infant was admitted to this hospital 16 June 1957. He had been born in the hospital 7 June 1957. Prenatal history was uneventful, and delivery was spontaneous and uncomplicated. The patient weighed 6 lb 8 oz at birth. His neonatal course was benign and he was discharged on the fifth day. Weight recorded 1 day prior to discharge was 6 lb 8 oz. The patient had done well until the seventh day of life, when he began vomiting, became extremely irritable, and had intermittent episodes of rapid, irregular respiration.

Positive physical signs on admission were cyanosis, Cheyne-Stokes respiration at a rate of 60 to 80 per minute, slight cardiomegaly, estimated cardiac rate of 300 per minute, and a palpable liver extending 4 cm below the right costal margin. Pertinent negative or normal findings were absence of edema, clear lungs, and normal neurologic examination. Admission weight was 6 lb 6 oz.

The hematocrit was 49 ml per 100 ml and the white blood cell count was 12,500 per cu mm, with a normal differential count. A roentgenogram of the chest appeared normal. The electrocardiogram revealed supraventricular tachycardia of 270 per minute (fig. 1).

The patient was placed in an incubator, and oxygen was administered. Digitalization with Cedilanid (lanatoside C) was initiated, with a total digitalizing dose of 0.02 mg per pound of body weight, given intramuscularly in a single

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From Madigan General Hospital, Tacoma, Wash. Major Tomsovic is now assigned to Walter Reed Army Institute of Research, Washington, D.C.

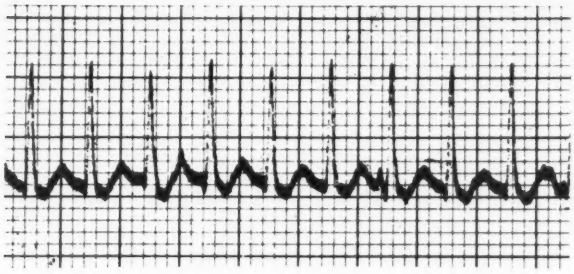

Figure 1. Electrocardiogram of 16 June 1957. Lead II. First episode of paroxysmal atrial tachycardia. Ventricular rate, 270 per minute.

injection. The cardiac rate 6 hours postdigitalization was more than 200 per minute. It had dropped to 150 per minute when next checked 30 minutes later. An electrocardiogram on 17 June confirmed sinus rhythm of 150 (fig. 2). All signs and symptoms of congestive failure disappeared within 48 hours. Respiration returned to normal. A weight loss of 7 oz was noted. When the infant was removed from oxygen, cyanosis did not recur.

The patient's subsequent course in the hospital showed return of normal functions. He was discharged on a daily 0.05 mg maintenance dose of Digoxin. His weight on discharge was 6 lb 1 oz.

Follow-up visits to the clinic at regular intervals demonstrated a healthy, growing, adequately developing infant. No aberration of cardiac rate occurred. Digoxin was discontinued in mid-August 1957.

In March 1958, at 9 months of age, the child was rehospitalized. He had done well until 4 days prior to admission, when he became anorexic and irritable. The night prior to admission, he had an episode of vomiting and seemed extremely restless. This continued until the time of admission.

Physical findings on this admission appeared to be within normal limits, except for a regular tachycardia greater than 250 per minute. The patient weighed

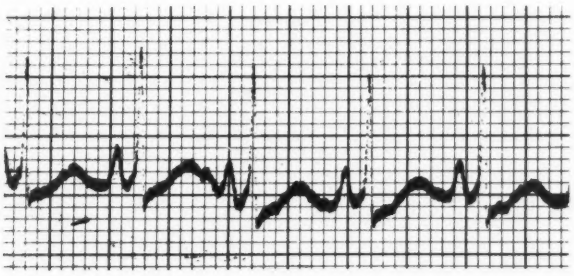

Figure 2. Electrocardiogram of 17 June 1957. Lead II. First episode of tachycardia; reversion to normal rhythm. Ventricular rate, 150 per minute.

19 lbs. The electrocardiographic tracing again demonstrated a rapid, supraventricular tachycardia. Other laboratory determinations and roentgenograms were normal.

Carotid sinus pressure and eyeball pressure did not alter the tachycardia. Digoxin was administered intramuscularly. One half of the calculated digitalizing dose produced a slight decrease in cardiac rate after 9 hours. An additional one fourth of the calculated digitalizing dose was given. Three hours later, the rate was regular at 150 per minute. It was noted during this hospitalization that the patient had a rectal temperature of 102°F, but there were no signs suggesting the presence of an infection. Two days later, without antibiotic or antipyretic treatment, the patient was afebrile. The child was discharged on a maintenance dose of elixir of Digoxin, 0.07 mg per day; this was later increased to 0.125 mg per day. No obvious cause for the paroxysmal auricular tachycardia had been demonstrated.

The child continued to do well until early July 1958, when at age 13 months, he was seen in the clinic. The mother noted that the child was anorectic. He appeared normal but had a temperature of 101.2° F rectally. His pulse was regular but greater than 250 beats per minute. Carotid sinus pressure lowered the pulse rate to 110 per minute immediately; this remission persisted.

Many multiple-lead electrocardiograms were taken on this infant throughout the 14 months of follow-up and were interpreted by a qualified cardiologist. A careful search for Wolff-Parkinson-White syndrome, ectopic pacemaker, or myocardial disease of any description was unavailing. All electrocardiograms made during the patient's well intervals were within normal limits.

When last seen at age 14 months, the child weighed 20 lb 14 oz, was 30 inches tall, and was normal for age in every modality. He was continued on 0.18 mg of Digoxin daily. The patient was lost to follow-up when the family moved to another area.

DISCUSSION

Paroxysmal tachycardia is diagnosed by a cardiac rate of 180 or more and characteristic superimposition of P and T waves in the electrocardiogram. Paroxysmal rapid heart action was first described in 1854 by Stokes [3] and was first demonstrated in an infant less than 1 year of age by Werley [4] in 1925. In 1941, Hubbard [5] reported 9 cases in the infant age group and stressed that symptomatology varied markedly from that expected in older children and adults. Vomiting, limpness, diarrhea, and obvious prostration were considered characteristic. As congestive failure developed, tachypnea and other stigmas of heart failure appeared. Fever and leukocytosis in the absence of infection were common findings. The heart rate usually was 250 to 300 per minute.

The cause of supraventricular tachycardia in the majority of cases in this age group has not been determined. A high incidence of supraventricular tachycardia is associated with the Wolff-Parkinson-White syndrome,[6] which accounts for a few cases in infants.

Congestive heart failure occurs only if the rapid rate persists longer

than 24 hours. Age is a definite factor in susceptibility to heart failure; the younger the infant, the greater the susceptibility. Nadas and associates [2] reported 41 cases in which congestive failure occurred in 75 percent of the 0- to 4-month age group as opposed to 25 percent in older subjects.

In infants, recurrence of attacks is less likely beyond the year after onset of tachycardia; this does not seem to be true in older children. Infants with Wolff-Parkinson-White syndrome (and possibly those who display only shortened P-R intervals) are definitely prone to repeated attacks. Although rest, oxygen, and diuretics are appropriate treatment if congestive heart failure is present, rapid digitalization is the treatment of choice in supraventricular tachycardia at all times. Vagal stimulation and cholinergic drugs are not as effective or reliable in terminating paroxysmal tachycardia in infants as in older patients. An infant will rarely die of paroxysmal tachycardia less than 72 hours in duration; therefore, if the infant is seen early, digitalis should be given a full trial. Up to 1½ times the usual calculated digitalizing dose may be given in the first 24 to 36 hours.

The choice of digitalizing preparations may be dictated by the condition of the patient. Short-acting preparations are preferable in infants. The prognosis in digitalized patients is excellent.

Of the digitalis preparations available, Digoxin seems most ideal for pediatric use. Its virtues are the moderately rapid onset of its effect and its relatively short duration of action. Thus, dosage may be manipulated to attain maximal digitalization rapidly without hazard of prolonged toxicity. It is now generally conceded that the digitalizing dose of Digoxin ranges from 0.015 mg to 0.04 mg per pound of body weight.[7,8] In children 2 years of age or younger, adequate digitalization tends to occur at the higher dosage level. In early postnatal life, toxic reactions are common and a lower dose and less rapid digitalization are generally wise.

When digitalis fails to abort the tachycardia, methacholine, 0.2 to 0.3 mg per kilogram given subcutaneously, or quinidine, 3 to 5 mg per pound, may be resorted to. One should use careful, frequent electrocardiographic controls when administering methacholine, and an intravenous infusion should be running so that atropine can be given to counteract toxic effects of the drug without delay.

SUMMARY

Paroxysmal atrial tachycardia, a cause of congestive heart failure in newborn infants, offers an excellent prognosis if diagnosed early and treated adequately. A case of supraventricular tachycardia with

heart failure in an infant, first observed at 9 days of age and followed for 14 months, is presented. Digitalization is the treatment of choice, and some aspects of digitalis therapy for this condition are outlined.

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UNDERCOVER AGENTS

The striking and perhaps sobering implication to be drawn from current virology is that a large proportion, perhaps the bulk, of the agents responsible for human virus disease still remains to be discovered. . . . Possibly viruses exist which do not cause obvious acute disease but which may well be responsible for chronic or long-term results which at present are not suspected as being of viral etiology. A significant pointer in this direction is the circumstantial evidence that a strain of mumps virus had been responsible for a large number of cases of subacute thyroiditis. It appears likely that the mumps virus could, in a few days, so damage the thyroid as to lead to autoantibody production which in extreme cases could result in virtual extirpation of the functioning thyroid by autoantibody.—John E. Hotchin: Virology Advances. *Health News*, February 1960.

Military Medical News

Air Force Promotes White and Cullen to Major General; Jennings, Jenkins, Humphreys, Strickland Receive Stars

White

Jenkins

Cullen

Four new brigadier generals and 2 major generals have been named by the U.S. Air Force. Receiving their second stars were major generals Major S. White, USAF, MC, surgeon, Air Training Command, Randolph Air Force Base, Texas, and John H. Cullen, USAF, MC, deputy surgeon general, U.S. Air Force.

During his tenure of duty as director, Medical Staffing and Education, Office of the Air Force Surgeon General, General White developed an educational program assuring the availability of properly qualified medical personnel to support the new requirements of aerospace operations. As former director, Plans and

Jennings

Strickland

Humphreys

Hospitalization, Office of the Surgeon General, USAF, General Cullen was responsible for the management and operation of the worldwide Air Force hospital system.

Advanced to general officer status were brigadier generals James W. Humphreys, Jr., USAF, MC; Raymond T. Jenkins, USAF, MC; Aubrey L. Jennings, USAF, MC; and Benjamin A. Strickland, Jr., USAF, MC.

General Humphreys is commander of the USAF Hospital, Wright-Patterson Air Force Base, Dayton, Ohio.

Assigned as director, Plans and Hospitalization, Office of the Air Force Surgeon General, General Jenkins was formerly surgeon of the Twelfth Air Force.

General Jennings, director, Professional Services, Office of the Surgeon General, USAF, assisted in developing the Air Force Clinic, a new concept in medical support for the military services.

General Strickland, surgeon, Air Defense Command, Ent Air Force Base, Colorado Springs, Colo., was instrumental in developing the indoctrination and education program of the Gunter Branch of the USAF School of Aviation Medicine, Gunter Air Force Base, Ala., while serving as commandant.

Eye Congress To Convene

The first Congress of the Asia-Pacific Academy of Ophthalmology will be held in Manila, Philippines, 10–13 October 1960, under the sponsorship of the Philippine Ophthalmological Society. Participants include delegates from the Asia-Pacific regions and guests from the Americas and Europe.

The theme of the Congress will be "Blinding Diseases of the Asia-Pacific Regions." Guest lecturers and their subjects include Dr. Joaquin Barraquer (Spain), "Surgery of the Crystalline Lens"; Dr. Saul Sugar (USA), "Angle Closure Glaucoma"; Dr. Tulsidas (India), "On Trachoma"; Dr. Geminiano de Ocampo (Philippines), "Choice of Operations in Keratoplasty"; Dr. Akira Nakajima (Japan), "Congenital and Hereditary Blindness in Japan"; Dr. Bruce Hamilton (Australia), "On Diabetic Blindness"; and Dr. D. L. McLaren (Africa), "On Nutritional Blindness."

International Burn Congress at Naval Medical Center

The first International Congress on Research in Burns will be held at the National Naval Medical Center, Bethesda, Md., 19–22 September 1960. More than 100 scientists from Canada, Mexico, Chile, Peru, Scotland, England, Sweden, Yugoslavia, China, Italy, and the U.S.S.R. will participate.

Some fifty 10-minute papers will be presented, covering such problems as skin grafts, immunology, metabolism, and surgery. On the final day of the meeting, investigators will present their ideas on needed additional research.

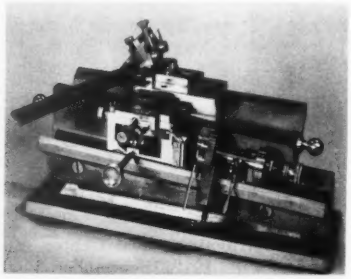
Honorary chairman of the Congress, being held under the auspices of the American Institute of Biological Sciences, is Dr. Frank B. Berry, Assistant Secretary of Defense (Health and Medical).

Cytology Meeting Scheduled

The Inter-Society Cytology Council will hold its annual meeting 23–25 September, at the Palmer House, Chicago, Illinois. Details may be obtained from Paul A. Younge, M.D., secretary-treasurer, 1101 Beacon Street, Brookline 46, Massachusetts.

Microtome For AFIP Museum

The Medical Museum of the Armed Forces Institute of Pathology has been presented with a 35-pound sliding microtome of medicohistorical significance. Once the possession of the late Russian-American histologist, Dr. Alexander Maximow, the microtome



Dr. Maximow's Microtome

was bestowed by Mrs. Eric Fennel, widow of Dr. Eric Fennel, Honolulu, Hawaii.

During his dramatic escape from Russia in the early 1900's, Dr. Maximow carried the instrument on his back across the frozen Gulf of Finland. Upon his death in this country in 1928, the microtome became the property of Dr. Fennel, in appreciation of his friendship and beneficence.

Dr. Maximow is renowned for his co-authorship of "Textbook of Pathology," and for his investigations of inflammation, hemopoiesis, and the normal and pathologic histogenesis of connective tissue.

Semi-Mobile Unit Year Old

Oklahoma's first semi-mobile army reserve unit, the 44th Evacuation Hospital, is 1 year old. Colonel Hervey A. Foerster, MC, USAR, commander of the hospital, points out that the unit now includes 38 medical officers, 4 nurses, 3 warrant officers, and 116 enlisted men. Forty more enlisted personnel are needed to bring the unit up to peacetime strength.

The 44th staff served the summer active duty training period at Camp Hood, Texas, 5–19 June. Advisor to the group is Lieutenant Colonel Stephen Houston, MC, USA.

Officers Certified By Specialty Boards

The surgeons general of the military medical services have announced that the following regular Medical Corps officers have been certified by the specialty boards indicated.

American Board of Anesthesiology

Wiley, Homer P., Comdr., USN

American Board of Dermatology

Akers, William A., Capt., USA
Fisher, William C., Maj., USA
Grimmett, Richard H., Lt., USN
Heising, Ralph A., Lt., USN
Steagall, Robert W., Jr., Lt., USN

American Board of Gastroenterology

Nielsen, Orville F., Comdr., USN

American Board of Ophthalmology

Kern, Arthur S., Lt., USN
Longfellow, Don W., Capt., USA
Zamora, Pablo J., Maj., USA

American Board of Orthopedic Surgery

Hayes, William E., Lt. Comdr., USN
Peacock, Howard K., Jr., Lt. Comdr., USN
Rieder, John J., Capt., USN
Stalker, Daniel E., Maj., USA

American Board of Pathology

Pathologic Anatomy

Matthews, Warren F., Capt., USA

Clinical Pathology

Matthews, Warren F., Capt., USA

American Board of Pediatrics

Pearson, Howard A., Lt., USN

Bernier Named Dental Chief

Colonel Joseph L. Bernier, DC, USA, has been named Assistant Surgeon General of the Army, with rank of major general. He is the seventh dental corps officer to hold this rank, and

the first Army dentist to be promoted to major general from colonel. He will become chief, U.S. Army Dental Corps, 1 August 1960, succeeding Major General James W. Epperly, DC, USA, who retires at the end of July.

Named one of the twelve outstanding dentists in the history of American dentistry by the U.S. Information Agency and the National Library of Medicine, Colonel Bernier is the first certified oral pathologist in the Army Dental Corps and the only American military dental officer to be elected a fellow in Dental Surgery of the Royal College of Surgeons in London. He organized the American Academy of Oral Pathology in 1946 and also founded the American Board of Oral Pathology, serving as secretary for more than 10 years before being elected as president of the Board, a position he now holds.

A graduate of the University of Illinois in 1932, Colonel Bernier entered the military service during that year as a first lieutenant and was assigned to Walter Reed General Hospital, Washington, D.C. With the exception of 2 short tours of duty in the Panama Canal Zone and service in the European Theater during World War II, his Army service has been in the Washington, D.C., area.

At the end of the war the colonel returned to his former post as chief, Oral Pathology Branch, Armed Forces Institute of Pathology. Since 1945 he has served as professor of oral pathology at Georgetown University and at the Army Dental School, Walter Reed Army Institute of Research.

His membership in professional groups covers the full range of national and international dental organizations and societies. In 1955 he received the Thomas P. Hinman Award, the John R. Callahan Award of the Ohio State Dental Association, and the Tufts University School of Dentistry Award for leadership in oral pathology, and in 1957 the Alfred C. Fones Award of the Connecticut State Dental Society, and the Award of Merit of Georgetown University.

The author of several textbooks, including "Management of Oral Disease," used as a standard work in more than 25 dental schools, Colonel Bernier serves as associate editor of the *Journal of Oral Surgery*, and *Oral Surgery, Oral Pathology and Oral Medicine.*

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Progress Notes

Dr. **V. S. Waravdekar,** chief, Biochemistry Branch, Armed Forces Institute of Pathology, Washington, D.C., has received a grant of $8,400 from the Damon Runyon Memorial Fund for Cancer Research. Dr. Waravdekar will apply the grant to the investigation of the relationship of the enzyme diphosphopyridine nucleotide (DPN) to tumor growth.

Lieutenant Colonel **Katharine E. Manchester,** AMSC, chief, Food Service Division, Brooke General Hospital, Fort Sam Houston, Texas, will become chief, Dietitian Section, and assistant chief, Army Medical Specialist Corps, upon the retirement of Lieutenant Colonel **Helen M. Davis,** AMSC, this month. . . Captain **Benjamin G. Feen,** MC, USN, executive officer, U.S. Naval Hospital, Philadelphia, Pa. has been assigned as commanding officer of that unit.

Three allied officers are among the 18 dentists attending the advanced dentistry class of the Army Postgraduate School of Dentistry, Walter Reed Army Institute of Research, Washington, D.C. They are, Captain **Abdul Latif Shaikh,** Pakistan; Lieutenant Colonel **Carl E. Purdy,** Manitoba, Canada; and Major **Myohng Sokh Paek,** Korea. Brigadier General **Clarence P. Canby,** DC, USA, is director of Dental Activities, Walter Reed Army Medical Center.

A course in occupational medicine, held at the U.S. Army Environmental Health Laboratory, Army Chemical Center, Md., 2–6 May, covered the history, scope, and objectives of occupational health programs, with emphasis on the team approach to occupational health and medicine. The course was directed by Colonel **Adam J. Rapalski,** MC, USA, commanding officer of the laboratory.

Colonel **William E. Jennings,** VC, USA, chief veterinarian, Fifth U.S. Army, Chicago, Ill., has been presented an honorary degree from the Free University of Berlin for his contribution to veterinary education. He is the first American to receive the award. Prior to his current Fifth Army assignment, Colonel Jennings was chief veterinarian of the U.S. Forces in Europe from 1955 to 1958.

Captain **John Atkins,** MSC, USA, formerly methods improvement officer, DeWitt Army Hospital, Fort Belvoir, Va., has been assigned to the Medical Plans and Operations Division, Army Surgeon General's Office, Washington, D.C. . . . Colonel **Wayne D. Shipley,** VC, USA, is the new assistant chief of the Veterinary Division, U.S. Army. Colonel Shipley has recently returned from Europe, where he served as NACOM Area Veterinarian.

Major **Ruth Purvis,** ANC, has assumed duties as chief of nursing service, 106th General Hospital, El Paso, Texas. She was previously assigned to the Third Field Hospital, Fort Benning, Ga.

The International College of Surgeons Section on Ophthalmology and Otorhinolaryngology has renamed its research grant in honor of the late Vice Admiral **Ross T McIntire,** MC, USN . . . Captain **Ralph D. Ross,** MC, USN, head, Medical Branch, Professional Division, Bureau of Medicine and Surgery, Washington, D.C., has succeeded Captain **John W. Albrittain,** MC, USN, as Medical Education for National Defense (MEND) scientific officer and Navy representative on the Federal MEND Council.

Twenty-seven conferees, including chief nurses of major Army hospitals, medical centers, the 6 Army areas, and other key staff nurses, met in Washington, D.C., recently with Army

Surgeon General Lieutenant General **Leonard D. Heaton,** and Colonel **Margaret Harper,** ANC, chief, Army Nurse Corps. During the 2-day conference, personnel, training, utilization, procurement, and career-planning policies were discussed. The last chief nurses' conference was held in 1958.

Colonel **Pierre O. Evans,** DC, USA, is the new chief of the Dental Service, Fitzsimons General Hospital, Denver, Colo. He replaced Colonel **William B. Irby,** DC, USA, who is en route to a duty assignment in Germany . . . Captain **Burt W. Phillips,** MC, USA, has been assigned to the Department of Neuropsychiatry, Fitzsimons General Hospital. Captain Phillips is a former instructor of psychiatry at the University of Colorado School of Medicine.

Rear Admiral **Bartholomew W. Hogan,** MC, USN, surgeon general, U.S. Navy, received 2 certificates of honorary membership during his recent trip to Europe. Following his attendance at the SHAPE Medical Conference in Paris, Admiral Hogan was presented an honorary membership in the Municipal Counsel of Paris, and later, while visiting medical activities in Austria, was made an honorary life member of the American Medical Society of Vienna.

Lieutenant Colonel **Frederic Eastland,** MC, USA, commanding officer, 250th General Hospital, Fort Sam Houston, Texas, has accepted an award naming his hospital a "superior Strategic Air Command unit." The Continental Army Command award was presented by Major General **William E. Shambora,** MC, USA, commanding general, Brooke Army Medical Center. The 250th General Hospital was one of 3 medical units of the Strategic Air Command's 360 organizations to receive the superior rating for 1959.

Captain **Ashton Graybiel,** MC, USN, U.S. Naval School of Aviation Medicine, Pensacola, Fla., has been selected by the Navy League as recipient of the William S. Parsons Award. Dr. Graybiel is planning the medical aspects of the recovery phase of Project MERCURY.

Major General **Clement F. St. John,** MC, USA, commanding general, Walter Reed Army Medical Center, Washington, D.C., has received the Alumni Achievement Award from the Ohio State University College of Medicine. General St. John, a 1928 graduate of the College of Medicine, received the award in recognition of outstanding professional attainment and distinguished service to mankind. . . . **John D. Piacitelli,** MSC, USA, chief, Medical Social Service Work Section, Madigan Army Hospital, Tacoma, Wash., has been promoted to the rank of captain.

Colonel **Oscar P. Hampton, Jr.,** MC, USAR, former chief, Orthopedic Branch, Surgical Consultants Division, Office of the Surgeon General, U.S. Army, has been elected president of the St. Louis Orthopedic Society. Colonel Hampton served as consultant, Orthopedic Surgery, North African and Mediterranean Theater, during World War II . . . The American Medical Association has approved a 1-year residency program in pulmonary disease at the U.S. Naval Hospital, St. Albans, N.Y.

Captain **Ira C. Nichols,** MC, USN, former executive officer of the U.S. Naval Hospital, Chelsea, Mass., has been assigned as district medical officer, First Naval District, Boston, Mass. . . . Captain **James J. Humes,** MC, USN, U.S. Naval Hospital, San Diego, Calif., has been ordered to duty at the Armed Forces Institute of Pathology, Washington, D.C. . . . Colonel **Thomas A. McFall,** DC, USA, director, Dentistry Division, Walter Reed Army Institute of Research, Washington, D.C., has announced a 16-week course in advanced dentistry to be held at the Institute beginning 1 August.

The Medical Officer Writes

Articles Published in Other Journals

U.S. Army

HEAT FOR THE RELIEF OF PAIN. Captain Rachel H. Adams, AMSC, Army Medical Service School, Brooke Army Medical Center, Fort Sam Houston, Texas. *Physical Therapy Review*, February 1960.

THE TREATMENT OF DEEP MYCOTIC INFECTIONS WITH AMPHOTERICIN B, WITH PARTICULAR EMPHASIS ON DRUG TOXICITY. Captain Hallard W. Beard, MC, USA, Major Joel H. Richert, MC, USA, and Major Richard R. Taylor, MC, USA, U.S. Army Medical Research and Nutrition Laboratory, Fitzsimons General Hospital, Denver, Colo. *American Review of Respiratory Diseases*, January 1960.

USE OF POLYETHYLENE PLASTIC BAGS FOR STORAGE OF PATHOLOGIC TISSUE. Major Charles B. Broadway, USAF, MSC, and Master Sergeant Donald G. Koelle, USA, Ret., Armed Forces Institute of Pathology, Washington, D.C. *Technical Bulletin of the Registry of Medical Technologists*, February 1960.

FOOD AND HEALTH, THE U.S. ARMY VETERINARY CORPS—FROM EARLY MILITARY HISTORY TO THE SPACE AGE. Jeanette R. Bryant, Office of the Surgeon General, U.S. Army, Washington, D.C. *Journal of the American Dietetic Association*, March 1960.

TOPICAL ANESTHESIA FOR ESOPHAGOGASTROSCOPY. Major David P. Buchanan, MC, USA, Letterman General Hospital, San Francisco, Calif. *American Journal of Digestive Diseases*, February 1960.

VARYING RESPONSES TO RADIOACTIVE IODINE (I^{131}) THERAPY IN HYPERTHYROID PATIENTS. Captain Melvin D. Cheitlin, MC, USA, Lieutenant Colonel Robert Bernstein, MC, USA, and Lieutenant Colonel Edward A. Langdon, MC, USA, Walter Reed General Hospital and Walter Reed Army Institute of Research, Washington, D.C. *Annals of Internal Medicine*, February 1960.

THE MICROCIRCULATION OF THE SKIN. Major Michael J. Davis, MC, USA, Captain D. Joseph Demis, MC, USA, and Captain James C. Lawler, MC, USA, Walter Reed Army Institute of Research, Washington, D.C. *Journal of Investigative Dermatology*, January 1960.

A STUDY OF THE CUTANEOUS EFFECTS OF SEROTONIN. Captain D. Joseph Demis, MC, USA, Major Michael J. Davis, MC, USA, and Captain James C. Lawler, MC, USA, Walter Reed Army Institute of Research, Washington, D.C. *Journal of Investigative Dermatology*, January 1960.

HEMOLYTIC DISEASE OF THE NEWBORN DUE TO ANTI-C, A CASE REPORT. Colonel Wilbur W. Hiehle, MC, USA, Captain Manuel D. Altamirano, MSC, USA, Captain Harry H. Kuhlman, MC, USA, with technical assistance of Master Sergeant Lynn A. Saxton, USA, U.S. Army Hospital, Sandia Base, N. Mex. *American Journal of Obstetrics and Gynecology*, March 1960.

DISCOGRAPHY, TECHNIQUE AND INTERPRETATION. Captain Charles Keck, MC, USA, Fort Hood, Killeen, Texas. *A.M.A. Archives of Surgery*, April 1960.

Titles of articles in current periodicals written by commissioned officers and civilian scientists in the medical services of the Department of Defense will be published each month insofar as space permits. This listing is gleaned from available periodicals and is not necessarily complete. Authors desiring inclusion of published articles are invited to send a reprint to the *Journal*—EDITOR.

THE EFFECT OF LOCAL ANESTHETICS ON THE RESPIRATION OF DENTAL PULP. George Kozam, D.D.S., Ph. D., and Lieutenant Colonel George W. Burnett, DC, USA, Walter Reed Army Institute of Research, Washington, D.C. *Oral Surgery, Oral Medicine and Oral Pathology*, February 1960.

PAPER ELECTROPHORETIC SEPARATION AND ELUTION OF SOME ANTITUBERCULOUS DRUGS AND THEIR METABOLITES. Captain John R. Maher, MSC, USAR, and John D. Hansen, U.S. Army Medical Research and Nutrition Laboratory, Fitzsimons General Hospital, Denver, Colo. *American Review of Respiratory Diseases*, March 1960.

TREATMENT OF DRUG OVERDOSAGE; PLAN OR PANIC? Major Max K. Mendenhall, MC, USA, and Lieutenant Colonel John A. Jenicek, MC, USA, Brooke General Hospital, Fort Sam Houston, Texas. *Texas State Journal of Medicine*, February 1960.

ACHIEVEMENTS OF WOMEN IN MEDICINE, PAST AND PRESENT—WOMEN IN THE MEDICAL CORPS OF THE ARMY. Lieutenant Colonel Clara Raven, MC, USAR, U.S. Army Hospital, Fort Sill, Okla. *Military Medicine*, February 1960.

THE RELIABILITY OF TISSUE DIAGNOSIS OF PLEURISY: A PRELIMINARY REPORT. Major Joel H. Richert, MC, USA, Colonel James A. Wier, MC, USA, Colonel John M. Salyer, MC, USA, and Major James C. Beyer, MC, USA, Fitzsimons General Hospital, Denver, Colo. *Annals of Internal Medicine*, February 1960.

CAT-SCRATCH DISEASE. Norman H. Rickles, D.D.S., M.S., and Colonel Joseph L. Bernier, DC, USA, Armed Forces Institute of Pathology, Washington, D.C. *Oral Surgery, Oral Medicine and Oral Pathology*, March 1960.

NONSPECIFIC IMMOBILIZATION IN THE *TREPONEMA PALLIDUM* IMMOBILIZATION (TPI) TEST. Robert W. Sanders, Lieutenant Donald R. Piper, MSC, USA, William A. Hook, M.S., and Major Louis H. Muschel, MSC, USA, Walter Reed Institute of Research, Washington, D.C. *American Journal of Clinical Pathology*, February 1960.

A CAPILLARY SAMPLING TECHNIQUE FOR THE DETERMINATION OF CHOLINESTERASE ACTIVITY IN RED CELLS AND PLASMA. Jane L. Stubbs, B.S., M.T., and John T. Fales, Clinical Investigation Branch, Chemical Warfare Laboratories, Army Chemical Center, Md. *American Journal of Medical Technology*, January–February, 1960.

SPLENOPORTOGRAPHY: CLINICAL APPLICATIONS. Colonel Benjamin H. Sullivan, Jr., MC, USA, Lieutenant Colonel Longstreet C. Hamilton, MC, USA, Major Robert D. Gamble, MC, USA, Walter Reed General Hospital, Washington, D.C., Howard E. Ticktin, M.D., and Edwin Cornwell, M.D. *American Practitioner & Digest of Treatment*, February 1960.

MIDDLE LOBECTOMY FOR TUBERCULOSIS IN CHILDHOOD. Lieutenant Colonel David E. Thomas, MC, USA, Valley Forge General Hospital, Phoenixville, Pa., and Major Dean Winn, MC, USA, Fitzsimons General Hospital, Denver, Colo. *Journal of Thoracic and Cardiovascular Surgery*, February 1960.

PLEURAL BIOPSY AND DECORTICATION AS A DIAGNOSTIC TOOL. Lieutenant Colonel David E. Thomas, MC, USA, and Jay H. Anderson, Valley Forge General Hospital, Phoenixville, Pa. *American Review of Respiratory Diseases*, March 1960.

RESULTS AND COMPLICATIONS OF PLEURECTOMY FOR BULLOUS EMPHYSEMA AND RECURRENT PNEUMOTHORAX. Captain Paul A. Thomas, MC, USA, Tripler Army Hospital, Honolulu, Hawaii, and Paul W. Gebauer, M.D. *Journal of Thoracic and Cardiovascular Surgery*, February 1960.

U.S. Navy

"Second Look" for Adrenocortical Carcinoma. Lieutenant Yorke G. Jacobson, MC, USN, and Captain Jesse F. Richardson, MC, USN, U.S. Naval Hospital, St. Albans, N.Y. *Surgery*, March 1960.

Intestinal Protozoa and Helminths in School Children of Dacca, East Pakistan (East Bengal). Commander Robert E. Kuntz, MSC, USN, Naval Medical Research Unit #2, Taipei, Taiwan. *American Journal of Tropical Medicine Hygiene*, March 1960.

The Maintenance of Thermal Comfort in a Full Pressure Suit at Simulated Altitude. Louis J. SantaMaria, B.S., Sherwin J. Klein, Ph.D., and Herbert R. Greider, B.S., Air Crew Equipment Laboratory, Naval Air Material Center, Philadelphia, Pa. *Aerospace Medicine*, April 1960.

Feeding Problems in the Submarine Service. Commander John H. Schulte, MC, USN, U.S.S. HALIBUT SSG (N) 587, FPO, San Francisco, Calif. *Journal of the American Dietetic Association*, April 1960.

Comparison of Clinical Manifestations of Respiratory Illnesses Due to Asian Strain Influenza, Adenovirus, and Unknown Cause. Lieutenant Irwin Schultz, MC, USNR, Commander Benjamin Gundelfinger, MC, USN, Max Rosenbaum, M.S., Robert Woolridge, M.S., and Lieutenant Patricia De Berry, MSC, USN, Naval Medical Research Unit #4, Naval Training Center, Great Lakes, Ill. *Journal of Laboratory and Clinical Medicine*. April 1960.

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U.S. Air Force

Improved Phonetics in Artificial Denture Construction. Lieutenant Colonel Leslie R. Allen, USAF, DC, 3d Area Dental Laboratory, USAF Hospital Tachikawa, Tachikawa Air Base, Japan. *Dental Digest*, February 1960.

Medical Aspects of Ambient Radiations of Extraterrestrial Space. Colonel Paul A. Campbell, USAF, MC, Space Medicine Division, USAF School of Aviation Medicine, Brooks Air Force Base, Texas. *Journal of the American Medical Association*, February 13, 1960.

Simplification of Certain Aspects in the Performance and Interpretation of Complement-Fixation Tests. Howard S. Friedman, Ph. D., USAF Hospital, London, England. *Technical Bulletin of the Registry of Medical Technologists*, February 1960.

Variations in Serum Lipid Concentration and Clinical Coronary Disease. Colonel Marshall E. Groover Jr., USAF, MC, Major James A. Jernigan, USAF, MC, and C. D. Martin, M.D., USAF Hospital, Andrews Air Force Base, Washington, D.C. *American Journal of the Medical Sciences*, February 1960.

Human Cardioaccelerative Responses to Hypoxia in Combination With Heat. Henry B. Hale, Ph.D., U.S. Air Force School of Aviation Medicine, Brooks Air Force Base, Texas. *Aerospace Medicine*, April 1960.

Effects of Electrolyte Mixture on Cells From Human Iris. Captain John Y. Harper, Jr., USAF, MC, and C. M. Pomerat, Ph.D., USAF Hospital

Lackland, San Antonio, Texas and University of Texas Medical Branch, Galveston, Texas. *American Journal of Ophthalmology*, March 1960.

MICROWAVE EXPOSURE AND MISSILE PROPELLANTS AS OCCUPATIONAL HEALTH PROBLEMS. Colonel George M. Knauf, USAF, MC, Air Force Missile Test Center, Patrick Air Force Base, Fla. *American Journal of Public Health*, March 1960.

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INTERNAL DRAINAGE OF ACUTE PSEUDOCYST OF THE PANCREAS. Captain Wil B. Nelp, USAF, MC, and Lieutenant Colonel Strother B. Marshall, USAF, MC, USAF Hospital, Offutt Air Force Base, Neb. *Journal of the American Medical Association*, March 5, 1960.

IDIOPATHIC PAROXYSMAL MYOGLOBINURIA. Captain Paul J. Phillippi, USAF, MC, Captain Frederick R. Jones, USAF, MC, and Lieutenant Colonel Wilbur L. Kenoyer, USAF, MC, USAF Hospital, Lackland Air Force Base, Texas. *Journal of the American Medical Association*, February 27, 1960.

EXCHANGE TRANSFUSION IN A NEONATAL CRISIS OF CONGENITAL HEMOLYTIC ANEMIA. Manard E. Pont, M.D., Captain James A. Jones, USAF, MC, and Lieutenant Colonel James A. Bulen, USAF, MC, USAF Hospital Tachikawa, Tachikawa Air Base, Japan. *A.M.A. Journal of Diseases of Children*, February 1960.

POSTOPERATIVE CATHETERIZATION—YES OR NO? Captain Gerald B. Reams, USAF, MC, and Captain Elma J. Powell, USAF, NC, 7510th USAF Hospital, Wimpole Park, England. *American Journal of Nursing*, March 1960.

THE EFFECT OF PILOCARPINE STIMULATION ON THE HISTOLOGIC APPEARANCE AND THE SODIUM AND POTASSIUM CONTENT OF RAT SUBMAXILLO-SUBLINGUAL GLANDS. Major Ira L. Shannon, USAF, DC, and Captain Robert A. Brooks, USAF, MC, USAF School of Aviation Medicine, Brooks Air Force Base, Texas. *Oral Surgery, Oral Medicine and Oral Pathology*, February 1960.

HUMAN FACTORS IN SPACE FLIGHT. Lieutenant Colonel George R. Steinkamp, USAF, MC, USAF School of Aviation Medicine, Brooks Air Force Base, Texas. *Journal of the Arkansas Medical Society*, February 1960.

PULMONARY VENTILATORY FUNCTION IN MILITARY RECRUITS DURING HEALTH AND ACUTE VIRAL RESPIRATORY DISEASE, INCLUDING PNEUMONIA. Lieutenant Colonel Robert B. Stonehill, USAF, MC, Captain Norbert Schalet, USAF, MC, USAF Hospital, Sampson Air Force Base, N.Y., William Y. Fong, M.D., Herbert Saltzman, M.D., and Harold B. Houser, M.D. *American Review of Respiratory Diseases*, March 1960.

SOLAR IRRADIANCE FROM MERCURY TO PLUTO. Hubertus Strughold, M.D., and Oscar L. Ritter, Ph. D., USAF Aerospace Medical Center, Brooks Air Force Base, Texas. *Aerospace Medicine*, February 1960.

PHYSIOLOGICAL ASPECTS OF HYPERGRAVIC AND HYPOGRAVIC STATES; APPLICATION TO SPACE FLIGHT. Major Julian E. Ward, USAF, MC, Biomedical Division, Air Force Ballistic Missile Division, Los Angeles, Calif. *Journal of the American Medical Association*, February 13, 1960.

RADIATION INDUCED CENTRAL NERVOUS SYSTEM DEATH. A STUDY OF THE PATHOLOGIC FINDINGS IN MONKEYS IRRADIATED WITH MASSIVE DOSES OF COBALT 60 (GAMMA) RADIATION. Stephen G. Wilson, Jr., M.D., Randolph Air Force Base, Texas. *Journal of Neuropathology and Experimental Neurology*, April 1960.

This Is Your A. M. A.

THE COUNCIL ON FOODS AND NUTRITION of the American Medical Association has dramatically expanded its scope of activity in the past few years. Originally a subcommittee of the old Council on Pharmacy and Chemistry, it became a separate committee in 1931 and was elevated to council status in 1936.

Until 5 years ago, its primary activities centered around its "Seal of Acceptance" program for special dietary products. During this period, the Council actively participated in many public health nutrition projects, such as the enrichment of flour and bread, and the fortification of whole milk with vitamin D. The Council's concern for adequate pretesting of food additives was partially responsible for the founding of the Food Protection Committee as part of the Food and Nutrition Board of the National Research Council.

Since 1955, the Council has continually re-evaluated and enlarged its program. Its primary concern, at present, is to provide up-to-date nutrition information to both physicians and laymen. Several nutrition symposiums on current or controversial topics are sponsored each year for the benefit of the general practitioner. Papers from these symposiums are published in *The Journal of the American Medical Association* and then distributed in monograph form to medical libraries, medical schools, physicians, and members of allied professions. A symposium, held in Boston on 19 May 1960, dealt with nutrition in tooth formation and dental caries. The Council also cooperated in the presentation of a nutrition symposium last month at the annual meeting of the American Medical Association. A third symposium will be held during the 1960 clinical meeting of the Association.

The Council has been responsible for more than 65 request articles, designed to stimulate exchange of ideas and procedures, that have appeared in *J.A.M.A.* in the past 4 years. Principally, these papers serve to review and interpret research studies of value to the profession. The Council also has prepared *J.A.M.A.* statements and editorials to inform the physician of the latest concepts in nutrition. At present, a committee is preparing a report on the role of fats in normal and therapeutic nutrition. This report will include a definition of the usual dietary fat levels in the United States as well as a discussion of nutrition in cardiovascular disease. Another committee is studying diets used in therapy of gastrointestinal diseases in order to explore the rationale of the so-called soft, bland, low-residue diets, et cetera. The committee hopes soon to be in a position to suggest specific research projects.

Though no longer active in an accepted foods program, Council members have maintained interest in practices of food production, labeling, and promotion technics. The members review educational advertisements, monographs, and other materials submitted by commercial and nonprofit organizations. Their experience in this field has been summarized in a book recently published under the title *Statements and Decisions of the Council on Foods and Nutrition of the American Medical Association.*

Recognizing the value of visual educational tools, the Council recently expanded its exhibit program. Nine displays are shown by staff members at nearly a dozen national meetings each year. This project provides a rare opportunity for the staff to meet and discuss the A.M.A. program with thousands of persons. Distri-

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From the Council on National Security of the American Medical Association. The views and opinions expressed are not necessarily those of the Department of Defense.—EDITOR.

bution of some pamphlets at the exhibits has exceeded hundreds of thousands of copies.

Education and clinical research in nutrition are encouraged by the Council in cooperation with The Nutrition Foundation, Inc. Each year they present the Joseph Goldberger Award for outstanding achievement in clinical nutrition, and award 10 research grants to medical students.

Last year the Council and the Communications Division cooperated with the Food and Drug Administration and the Better Business Bureau in an extensive campaign against nutrition nonsense and food faddism. A kit of materials, several exhibits, and a film, "The Medicine Man," were developed. Literally millions of people have been reached by these materials thus far. An education campaign for weight control has been equally successful. Similar projects in geriatric and teen-age nutrition are anticipated this year.

Current reorganization of the Association's Division of Scientific Activities promises to widen the resources and cooperation of the various sections, and a still broader and more intensive program should be possible in the near future.

THE FABRIC OF MEDICINE

The detailed teaching of the basic sciences of medicine is being increasingly attacked. Yet, provided the teaching of these subjects is constantly revised and pruned to modern standards, they should still be the foundation stones of medical education. Two years is, in all faith, little time in which to learn the vastly complex structure and functions of the human body. Many laymen would dearly love to acquire such knowledge, and yet some people seriously think that the modern medical student is hard put upon to be subjected to this brief intellectual discipline. If there is any sense of vocation in the students it should be a revelation as well as a discipline. . . . Early medical education must not become a series of clinical *hors d'oeuvre*. Clinical material can be used to highlight and clarify physiological and anatomical knowledge and principles but not constantly presented like a carrot under the donkey's nose. . . . Rather than see clinical medicine brought to the early years, I would suggest that if practicing doctors contributed to the teaching of anatomy and physiology (as was done in the past century) and this teaching was continued and woven into the clinical years, then the student would be really convinced that these subjects are the very fabric of medicine.—K. W. DONALD: Research and Clinical Medicine. *The Lancet*, November 14, 1959.

Correspondence

1612 Rhode Island Ave., N.W.
Washington 6, D.C.

Dear Sir:

My attention was directed to an article appearing in the *U.S. Armed Forces Medical Journal*, August 1959, on pages 905–907, written by Captain William I. Silvernail and Lieutenant Colonel Joseph Collins describing a "New Traction Device for Transportation of Patients with Fracture-Dislocation of Cervical Spine."

In the reference bibliography at the end of this article no mention was made of the publication of this or similar device in the Bulletin of the Hospital for Joint Diseases, April 1941, vol. 2, pp. 90–92. The device was marketed by the Clay-Adams Company under the name of "Herzmark-Adams traction reel" and advertised in medical journals. It was actually used by some Naval vessels in the hospital bays for transporting patients with fractures during the late war. It was also used in some Army hospitals. Reading the description published in the *United States Armed Forces Medical Journal*, the reel uses a cable wound on a drum, whereas my reel uses a metal strap wound on a drum. Otherwise the reel described by Dr. Silvernail seems identical with mine.

I note that a patent has been applied for the device. A patent was issued to me, #2282653.

It was my intention to apprise the authors but knowing that those stationed outside the continental U.S.A. are likely to move about frequently, I feel it is better to call it to the attention of those responsible for the publication.

MAURICE H. HERZMARK, M.D.

Monthly Message—Continued from page ii

time in the war, all the wounded were hospitalized on the day of battle.

In transport to general hospitals freight cars and wagon train had formerly been used. During the ensuing year Surgeon General Hammond instituted hospital trains for transport from railheads back to general hospitals. Thus in an extraordinarily short period the genesis of the proper organization of field medicine was conceived.

Frank B. Berry

FRANK B. BERRY, M.D.
Assistant Secretary of Defense
(Health and Medical)

Book Reviews

PEDIATRIC PATHOLOGY, by *Daniel Stowens*, M.D. 676 pages; illustrated. Williams & Wilkins Co., Baltimore, Md., 1959. Price $20.

This is a book both pathologist and pediatrician will avidly receive, for Stowens is a diplomate of both the American Board of Pediatrics and the American Board of Pathology. Since the early fifties pediatric pathology has become recognized as an integral part of general pathology, and pathologists who have exclusively devoted themselves to this subspecialty have done much to overcome the disinterest of general pathologists in this fascinating field. From the first chapter on growth and development to the last on diseases of the skin, one is continually made aware of all the disease processes that the infant and child may contract and the problems confronting this particular age segment of our population. Diseases of the placenta, erythroblastosis fetalis, congenital malformations, diseases due to bacteria, viruses, fungi, protozoa, and rickettsiae are all adequately covered. The rarer diseases are described concisely and the commoner ones are more than adequately covered. The chapter on sudden death in infancy is particularly interesting and may shed some light for both pathologist and pediatrician on this perplexing problem. The discussion of tumors is noteworthy because of the author's acquaintance with this particular phase of pediatric pathology. The chapter on the respiratory system is comprehensive and includes information on a new pathologic entity, pulmonary alveolar proteinosis, first recognized in 1958. The bibliography is detailed, complete, and current. There are many excellent detailed photographs from the vast files of the Armed Forces Institute of Pathology, whose medical illustration division is to be complimented on the caliber of their material. The style makes for easy reading and the publisher has aided the reader by the fine texture of paper, spacing, and size of print. The author has also catalogued 10,000 cases that were in the files of the Armed Forces Institute of Pathology, so that one can be made more cognizant of the contribution pediatric pathology has made as a subspecialty to general pathology, particularly in government hospitals, where about a quarter of a million babies are born annually to service personnel. I believe Stowen's "Pediatric Pathology" is a must for all pathologists actively engaged in pediatric pathology and to all pediatricians perplexed by the final pathologic picture as it relates to the clinical course.

CAPT. JOHN F. MC CABE, MC, USN

SHAPES OF SANITY, A Study in The Use of Modeling in the Waking and Hypnotic State, by *Ainslie Meares*, M.D., B. Agr. Sc., D.P.M. 468 pages; illustrated. Charles C Thomas, Publisher, Springfield, Ill., 1959. Price $13.50.

This book is essentially an exposition of the use of clay figure modeling as an adjunct to psychotherapy. Dr. Meares writes excitingly and cogently within a well constructed argument. In his hands modeling intensifies the emotional involvement of patients within the matrix of free associations and is thus particularly useful with obsessive and intellectualizing patients. Emotions are evoked rapidly and abreaction of unusual intensity is frequently seen. Dr. Meares actually warns those who will try this method about the degree of emo-

tional response seen. In introducing patients to this method, reverie is emphasized, such as just "letting the fingers do it." After the models are produced, the patient free-associates. These free associations most frequently center around feeling rather than factual material. Theoretically this method is related to the Jungian painting methods about which Dr. Meares has also written. Although insight may be more dramatically produced, it is unlikely that insight into defenses is gained. And although getting the conflict into the open may give a measure of relief, lack of working with resistances in transference causes this reviewer to have some reservations about long-term relief. The "skirmishing" between doctor and patient that is short-circuited by this method is the central point of eliciting resistances, so important to therapy. Early recognition of conflict and intensification of feeling certainly have their use in psychotherapy. Dr. Meares' book with its excellent text and pictures is recommended for libraries that support psychotherapists and is strongly recommended reading for those doing psychotherapy.

LT. COL. PAUL F. EGGERTSEN, USAF, MC

ATOPIC CATARACT, by *Emanual Rosen*, M.D. Publication Number 373, American Lecture Series, A Monograph in American Lectures in Ophthalmology, edited by *Donald J. Lyle*, B.S., M.D., F.A.C.S. 102 pages; illustrated. Charles C Thomas, Publisher, Springfield, Ill., 1959. Price $5.75.

This monograph presents the biomicroscopy, pathogenesis, differential diagnosis, and surgical prognosis of atopic cataracts, with a discussion of the cutaneous manifestations of the allergic diathesis and a statistical review of the literature. The biomicroscopic description and the fine drawings are well worth examining in detail. A list of practical recommendations for surgical management are included.

LT. COL. JOHN E. EDWARDS, MC, USA

THE EXTREMITIES, by *Daniel P. Quiring*, Ph. D. 2d edition, revised and edited by *John H. Warfel*, Ph. D. 120 pages; illustrated. Lea & Febiger, Philadelphia, Pa., 1960. Price $3.25.

This anatomic epitome of the extremities, accurately portraying their muscles, arteries, and nerves in admirable simplicity, is now available in the revised second edition after going through 8 reprintings in its first edition. It should be in the pocket of every medical student, and available on the shelf of every doctor who needs to know the anatomy of the extremities. It will also be invaluable to physiotherapists because it clearly depicts the motor points of muscles. This book is the rare one that can be recommended without reservations or qualifications.

CAPT. WALTER R. MILLER, MC, USN

LEUKOCYTE ANTIGENS AND ANTIBODIES, by *Roy L. Walford*, M.D. 182 pages; illustrated. Grune & Stratton, Inc., New York, N.Y., 1960. Price $6.75.

This is a "personal" book and a good one. By "personal" the reviewer means that the author has undertaken to put together the accumulated studies (technics, application, and interpretation) on leukocyte antigens and antibodies as he himself has experienced and evaluated them. This has been accomplished by presenting in some detail the important aspects of leukocyte immunology that can be found only in a large but scattered literature. The book begins with a detailed discussion of technics of separation of leukocytes from whole blood, their preservation *in vitro*, cell fractionation, and a critical appraisal of the methods that have been developed for demonstrating their antigen-antibody reactions. This is followed by a review and discussion of the specificity and reactions of certain leukocyte antigens and their antibodies; leukocyte autoantibodies; allergic

neutropenia and agranulocytosis; drug reactions of an immune nature that may involve leukocytes; the L.E. phenomenon; the possible association of leukocyte antibodies and homograft immunity; and the clinical significance of these leukocyte antibodies. The book ends with a comprehensive bibliography of 567 references made useful by cross reference to that part of the book where the article is mentioned or discussed. Since this is a "first" in its field it should prove most useful as a working text and reference book.

LT. COL. JOSEPH H. AKEROYD, MSC, USA

THE PHYSIOLOGICAL BASIS OF DIURETIC THERAPY, by *Robert F. Pitts*, Ph. D., M.D. Publication Number 366, American Lecture Series. A Monograph in The Bannerstone Division of American Lectures in Physiology. 332 pages; illustrated. Charles C Thomas, Publisher, Springfield, Ill., 1959. Price $9.75.

Although this monograph represents the author's opinion based upon his extensive physiologic, clinical, and research background, it covers a complex and fascinating subject in a readable fashion. Part I was written to provide a background of basic information on distribution of water and electrolytes within the body, mechanisms of regulation of volume and composition of the body fluids, and abnormalities of function resulting in edema. The author has succeeded with remarkable clarity in integrating the newer concepts regarding renal mechanisms of salt and water regulation. Part II begins with a functional classification of diuretics, followed by a discussion of the mechanism of action of each in sequence. It concludes with a brief discussion of certain general complications of diuretic therapy. The usefulness of the mercural diuretics, despite all the newer medications, is emphasized. This monograph was written for the student and the busy practitioner in an attempt to consolidate our old and newer knowledge of this complex but interesting aspect of medicine. There are selected references after each chapter and a brief summary has been provided at the end of each chapter for the more casual reader. From this viewpoint the book would make an excellent reference for leisure time study.

COL. JULES J. MC NERNEY, MC, USA

GENERAL PSYCHOTHERAPY, An Outline and Study Guide, by *John G. Watkins*, Ph. D., with an introduction by *Lewis R. Wolberg*, M.D. 255 pages. Charles C Thomas, Publisher, Springfield, Ill., 1960. Price $9.25.

This work is a manual that outlines the general field of psychotherapy and also presents a study guide for the multivaried subject matter by providing an annotated, classified bibliography of the significant textbook literature on each area considered for surveillance. It accomplishes this prodigious task by introducing each topic for study with a terse, synoptic interpretation of the subject and follows it with an outline of the contents under study. The annotated list of references is appended to each topic under discussion. The emphasis throughout remains on the psychologic approaches to treatment as would be expected of the author, who is a clinical psychologist. Psychotherapy defies universal connotation when considered in terms of its goals, methods, technics, and personality dynamics. We know of many disciplines that view mental health from a prejudiced slant on human nature. "The student studying psychotherapy is virtually adrift in a sea of contradictions, random opinions, biases and untestable hypotheses," comments Dr. Wolberg. In view of the restrictions of any single disciplinary approach toward human understanding, this book offers both a catholic and eclectic coverage of the field, ranging from "pharmacology to Zen Buddhism, from neurology to cybernetics." A comprehensive source of information is provided to serve the interests of therapists, students, researchers, and practitioners.

The book is divided into 5 areas. In the first section on the foundations of psychotherapy are considered conceptual definitions, personality theories, psychopathology and psychodynamics. In the next part theories and technics are delineated in terms of supportive, reconstructive, questionable, and pseudopsychotherapies. In the third part on preparations for psychotherapy are considered social history, medical and psychiatric examinations, psychologic testing, rapport, structuring, and therapeutic decisions. Specific therapeutic problems as listed in the APA diagnostic nomenclature manual are presented in the fourth part under symptoms, diagnostic evaluation, etiology, prognosis, treatment procedures, and case examples. The last section deals with research and evaluation in psychotherapy. Not to be overlooked is the splendid and pithy introduction by an outstanding authority, who commends the book as "one of the most significant contributions to appear in the field of psychotherapy." This manual will be welcomed by many disciplines, including psychiatrists, psychologists, social workers, educators, clergymen, law enforcers, and cultural anthropologists, at various levels of training ranging from students to board candidates.

LT. COL. FRANK KILLIAN, JR., USAF, MSC

MONOGRAPHS ON NEOPLASTIC DISEASE AT VARIOUS SITES. General editor, *D. W. Smithers*, M.D., F.R.C.P., F.F.R. Volume II, Tumors of the Bladder, edited by *David M. Wallace*, O.B.E., M.S., F.R.C.S. 351 pages; illustrated. Williams & Wilkins Co., Baltimore, Md. 1959. Price $11.50.

There has been an amazing flood of publications from the United Kingdom on neoplastic diseases since the war, prepared either by single or multiple authors, and at first one questions the need for another book on the subject. This monograph, however, is a valuable guide in understanding cancer of the bladder. Consisting of 7 sections, with 21 chapters and an appendix, and written by 14 authors, the book discusses biostatistics, industrial aspects, etiology and biochemistry, pathology, clinical assessment, methods of surgical treatment, and radiotherapy, and includes a statistical analysis of the results of treatment. In industrial cancer exposure may occur during manufacturing, use of materials, or other operations. There may be a long exposure-free period between initial exposure and tumor. The ultimate carcinogen may well be a metabolite of amine. In body sulfonation, blockage of primary amine by heavy amine groups, blockage of certain positions in the aromatic nuclei, hydrogenation, and formation of conjugates eliminate carcinogenicity, but conversion to salts cannot. Although the agents are well known and theories of mode of action abound, the exact location, the specific mode of action, and the specific metabolite are unknown. In the section on etiology and biochemistry compounds that have been shown to be carcinogenic are listed. Their specificity on bladder suggests that the agent must be present in urine, a fact proved by experimentation. In spontaneous bladder cancer it may be that as a result of some abnormality of tryptophan metabolism increased amounts of 3-hydroxyanthranilic acid are excreted, probably in conjugated forms. The section devoted to pathology outlines the basis for classification of bladder tumors at the Institute of Urology. The classification is based on the pattern, on histology (differentiation and cell type), and on spread by direct continuity. As far as the pattern is concerned, these tumors may be papillary, solid, or papillary and solid. The use of the term solid is regrettable, for Webster defines the word as: "not hollow, having its interior filled with matter," a definition equally applicable to papillary tumors! Histologically the tumors may consist of benign papilloma, differentiated transitional cell carcinoma, undifferentiated or anaplastic transitional carcinoma, squamous cell carcinoma,

adenocarcinoma, and other varieties of tumor. The difficulties in classification are discussed. In this section, beautifully illustrated with black-and-white and colored photographs, a most valuable discussion, presented by Pugh, is the detailed description of handling specimens. This chapter should be required reading for all urologists and pathologists. In section 5, Wallace presents a comprehensive clinical assessment of bladder tumor. Inadequate relaxation, full bladder, tumors at the fundus, and tumor at bladder neck constitute the common causes of mistakes during examination. Wallace attempts to clarify grading and staging and proposes a simple staging based on TNM principles. Section 6 deals with methods of surgical treatment. Either resection or cystodiathermy is recommended as the first choice of treatment in small or average-sized mucosal tumors and even in widespread multifocal tumors. Partial cystectomy or segmental resection is advised for lesions located at the bladder fundus or high on the lateral or posterior walls when there is a sharp line of demarcation between tumor and normal bladder mucosa, when there are no other tumors in the bladder, and when dealing with tumors of urachal origin. Selection of cases for total and radical cystectomy and for radiotherapy is carefully discussed. Clearly and simply written, beautifully illustrated, well organized, with little repetition, the monograph will be valuable to anyone interested in urology. The trained urologist will find clear expression of the British point of view; the young general surgeon or fellow in urology will discover detailed instructions on handling patients with bladder cancer. The pathologist and the investigator will find much basic information on handling specimens and on assembling reliable data for future studies.

FATHOLLAH K. MOSTOFI, M.D.

MAIL the June Reader Poll Questionnaire—*Now!*

PEDIATRIC CLINICS OF NORTH AMERICA, vol. 6, number 4, Symposium on Pediatric Surgery, November 1959. Consulting editor, *C. Everett Koop*, M.D. 302 pages; illustrated. W. B. Saunders Co., Philadelphia, Pa., 1959. Price $15 per year for 4 books issued quarterly.

In this interesting volume the editor has drawn upon the work of 36 contributors representing the fields of surgery, anesthesia, radiology, pathology, neurosurgery, pediatrics, and orthopedic surgery. This is not intended to be a complete work on pediatric surgery, but a collection of essays. They present 20 different subjects ranging through anomalies, preparation for and timing of surgery in the child, anesthesia for pediatric surgery, and various clinical considerations such as jaundice, abdominal pain, heart lesions, bleeding from the rectum, constipation, and megacolon. The urologic field is represented by discussions on hydrocele, pyelonephritis, and a sound, simple chapter entitled, "The Empty Scrotum." This contains a lucid, rational outline of courses of treatment. An interesting and valuable facet of this work is the inclusion of bibliographic references at the end of each chapter. This can serve the interested reader as a gateway to much more

exhaustive exploration of the subject. As an example, the section on lesions about the umbilicus is followed by 105 bibliographic references. Other interesting sections are on staphylococcic pneumonia and respiratory infections of surgical import. These are timely discussions of specters that always hang over the heads of pediatric patients. One subject not often presented in the fashion seen here is "Neurosurgery in the Prevention of Exogenous Mental Retardation." This essay brings up points that are not frequently considered and that perhaps should be given thought more often. These presentations are not detailed and exhaustive to the point that only a specialist in pediatric surgery would be interested, but instead seem to be pointed to outlining to those of broader interests the present status of diagnosis and treatment in this field. This volume will be of interest to surgeon and pediatrician as a report on the recent trends in the matters covered.

COL. DON S. WENGER, USAF, MC

DISEASES OF THE CHEST, INCLUDING THE HEART, edited by *J. Arthur Myers*, Ph. D., M.D., with 34 contributors. 1,015 pages; illustrated. Charles C Thomas, Publisher, Springfield, Ill., 1959. Price $34.50.

Only in chapter 16, page 349, one third of the way through, does one suspect that this book may be in its second—or later—edition, in H. Corwin Hinshaw's statement that "there has been little . . . advance in this field of pulmonary embolism since the first edition of this volume was prepared in 1947." The casualness of such an announcement in a book whose title page bears no indication of previous editions sets the whole tone of the work. Casual, to begin with, is the confusing variability of design from one chapter to the next, immediately apparent in the bibliographies. Casual, too, is the concept of "including" diseases of the heart in a single volume with diseases of the chest—and, one suspects, including them as an afterthought; for with part 1 entitled "Diseases of the Chest" and part 2 "Diseases of the Heart," the latter appears to lie outside the former, and having only 350 pages as against the 600 allotted to "the chest", to have the short end of the wishbone. And what value will the practitioner find in an 8-page coverage of arterial hypertension and hypertensive heart disease—hardly more space than in the Merck Manual? Too much an abridgment to be useful to radiologist, surgeon, pulmonary disease specialist, or cardiologist, yet too voluminous for the student, it is difficult to know for whom the work was intended. Often much verbiage is given to the trivial or commonplace, with the unusual, controversial, or problematic reduced to mere definitions: Pulmonary adenomatosis, listed as a tumor in the chapter on symptoms, is discussed in 5 lines under pneumonia, but never mentioned as such under chest tumors, where its relationship to alveolar cell carcinoma is not indicated. The subject index contains 7 references to bronchopneumonia, all bare mentions and not one of them in the chapter on pneumonia. The new entity pulmonary alveolar proteinosis is not to be found in the index; but one may stumble upon an inadequate and ungrammatical description of it on page 194, with the senior author's name misspelt. A certain amount of overlap might have been avoided had the contributors also been collaborators: Allergic pneumonia is discussed under both pneumonia and bronchial asthma. With a chapter devoted to Boeck's sarcoid, a repeat discussion of it under tumors of the chest seems expendable. Tumors of the heart, treated briefly under tumors of the chest (where they would seem to belong, if chest really means chest) are discussed again a little more extensively under rare diseases of the cardiovascular system. In the chapter on valvular deformities, it is stated that no successful surgical reconstruction of an insufficient mitral valve has been developed; but in the chapter on intracardiac surgery,

operative technics for effective correction of mitral insufficiency are described. Of greater moment than the relatively minor overlap is the lack of fresh illustrative material: Of the 13 figures in the chapter on pneumonia, for example, all but 1 are from this contributor's 1954 monograph, and the thirteenth is from a previously published article. Yet perhaps the illustrative material was also an afterthought, merely thrown in to break up solid pages. Thus, in some chapters, the text contains no references to the figures, often the illustrations are remote from the discussion, and the frustrated reader, attracted by an illustration and wishing to read the corresponding description, may give up in despair when he discovers that his only key, the index, is opening doors to a treasure hunt. Although the preface calls attention to the need of teams including internist, pediatrician, bronchoscopist, radiologist, bacteriologist, pathologist, anesthesiologist, and surgeon in the diagnosis and treatment of chest diseases, the pathologist is conspicuously absent. Striking evidences of the lack of morphologic approach are to be found in the chapters on pulmonary mycoses and on tumors of the chest: In the former—a golden opportunity for gross and microscopic photographs—every illustration is a roentgenogram. In the 100-page chapter on tumors of the chest, primary malignant tumors of the lung are wrapped up in 8 pages, partly sacrificed to 8 illustrations, all roentgenograms; the diligent reader may discover a few other roentgenograms of these tumors on earlier pages of the chapter, and a total of 3 unremarkable photographs of gross specimens, 2 of which are badly out of focus. The book abounds in typographic errors, misspellings, careless English, indexing defects—including a "Professor of Brochoscopy" in the roster of authors, a large boldface heading on "Problems in Adult, Non-Infected Crystic Disease," a recommendation for "petolinium" in hypertension, and such medical classics as "pruritis" and "coccidiomycosis"—and innumerable other evidences of poor copy editing and poor proofreading suggesting haste in conception and execution. The average reader may rate these as trivialities that do not detract from the weight and authority behind this work; but confronted with these errors and with the other deficiencies, he may also question the accuracy of any statement he reads here and may ask whether examination of these pages is worth the price of admission.

MAY SHERMAN, M.D.

MANAGEMENT OF THE AGED SURGICAL PATIENT, by *Sidney E. Ziffren*, M.D., with chapters on Anesthesia, by *Stuart C. Cullen*, M.D., Urology, by *Rubin H. Flocks*, M.D., and a discussion of The Cardiac and Diabetic Patient Facing Emergency Operation, by *Raymond F. Sheets*, M.D. 219 pages; illustrated. Year Book Publishers, Inc., Chicago, Ill., 1960. Price $7.50.

This small volume on some of the problems faced in connection with geriatric surgery serves a very useful purpose. As the author states in the preface, "Although the principles of surgical technique are the same in all age groups, many facets of surgical diagnosis and care are markedly different in the aged patient in contrast to the younger patient." The book is divided into 9 separate chapters for easy reference. Probably the most important and useful are the ones on preoperative preparation; anesthesia; and the operation, postoperative period, and complications. For the well-read and qualified surgeon there is little that is new in this book. The author's viewpoints, however, particularly on some of the more controversial subjects, are worth reading and considering. It is certainly to be recommended for study and as a guide to interns and residents who are new to the field. The bibliography is excellent.

CAPT. FELIX P. BALLENGER, MC, USN

548518 O - 60 - 7

SMOKING AND HEALTH, by *Alton Ochsner*, M.D. 108 pages; illustrated. Julian Messner, Inc., New York, 1959. Price $3.

This small book written in layman's language leaves no doubt that Professor Ochsner takes a dim view of smoking. Besides making the point that smoking is the cause of cancer of the lung, the author also incriminates smoking as causing other respiratory diseases, such as smoker's cough, smoker's throat, et cetera. He also implies that the man who smokes may become impotent; women, sterile; pregnant women may give birth prematurely and even lose a child. This book is invaluable to any individual or organization undertaking a crusade against smoking. From a purely medical viewpoint, the facts on which some of the rather dogmatic conclusions are based can stand more careful scrutiny and further evaluation.

COL. FRANK M. TOWNSEND, USAF, MC

ROENTGEN EXAMINATIONS IN ACUTE ABDOMINAL DISEASES, by *J. Frimann-Dahl*, M.D., Ph.D. 518 pages; illustrated. Charles C Thomas, Publisher, Springfield, Ill., 1960. Price $15.50.

The second edition of this book has been expanded by the addition of new material, greater detailed descriptions, and many new illustrations. The presentation of the material and the format of the book have not been changed. Several new chapters have been added and the remaining chapters have been rewritten. This volume is noteworthy for its excellent illustrations and description of the acute abdominal disorders that are ordinarily difficult to interpret on x-ray films. Following a thorough discussion of the normal roentgenographic findings and an explanation of the abnormal shadows found in pathologic conditions, the author describes and illustrates the diagnostic highlights of specific pathologic obstructions. The radiodiagnostic features of acute inflammatory diseases of the gastrointestinal tract, gallbladder, pancreas, peritoneum, kidney, and female genital organs are covered in the remainder of the book. This is a most outstanding book and should be of tremendous value to the surgeon and radiologist. The author has made an important and difficult area in diagnosis a lot easier. This book belongs in the doctor's office for quick reference and daily use.

COL. PETER ZANCA, MC, USA

MICROCHEMICAL METHODS FOR BLOOD ANALYSIS, by *Wendall T. Caraway*, Ph. D. 109 pages. Charles C Thomas, Publisher, Springfield, Ill., 1960. Price $5.25.

It is the opinion of many clinical chemists that they are requested to perform an increasing number of determinations on what appears to be a decreasing volume of blood. An obvious answer to this problem is the use of microtechnics, and the author of this little book skilfully and convincingly shows how micromethods may be easily introduced into the clinical chemistry laboratory. The first 25 pages present an excellent discussion on equipment and general technics, wherein is stressed the importance of accuracy in the initial measurement of serum. As an example, in the method for glucose an error of ± 0.005 ml in pipetting the serum would result in a final error of ± 10 percent, whereas an error of ± 0.05 ml in adding the copper reagent would result in a final error of only ± 1.4 percent. The remainder of the book covers detailed methodology of 26 quantitative clinical chemistry determinations. Where special reagents or items of equipment are required, or recommended, the name and address of the manufacturer are given as well as catalog number of the item. Every method described calls for serum, with "normal values" given as those generally accepted for the particular technic. As the distinction between macro, semimacro, micro, submicro and ultramicro is neither clear nor desirable, the author takes the re-

freshing stand that a method is "micro" if 0.1 ml or less of serum is required for a single analysis, and "macro" if more than 0.1 ml is required. Although the methods are presented in considerable detail, possibly to the annoyance of experienced chemists, such details are in the nature of practical methodologic suggestions that have stood the test of time in the author's laboratory. Clear and detailed instructions are given as to technics used for actual collection of blood by puncture of finger tip (adult) or foot (infant). Bibliography throughout the book is adequate. Whether these microtechnics are used in the hospital laboratory on human patients, or in a research laboratory on small animals, it is felt that the methods will be most useful in obtaining the maximum number of "blood chemistry" values on a minimum volume of sample. The only criticism is directed at the publisher's price (inflation notwithstanding) for a little book, devoid of costly plates and diagrams, printed in plain black and white, and bound in the most modest fashion. CAPT. HOWARD C. LEIFHEIT, MSC, USA

INTERNAL MEDICINE IN DENTAL PRACTICE, by *Leon H. Collins, Jr.*, A.B., M.D., F.A.C.P., F.C.C.P., and *Martin P. Crane*, B.S., M.D., Sc. D. (Hon.). 5th edition, thoroughly revised. 555 pages; illustrated. Lea & Febiger, Philadelphia, Pa., 1960. Price $8.50.

This standard introduction to or review of internal medicine has again been revised and brought abreast of recent advances in practice. Knowing how difficult it is to determine what to include in a small book about a large subject, the authors have done outstandingly well. The wealth of experience acquired from field-testing 4 previous editions has certainly helped to refine and concentrate essential information for the student, a term that includes the serious practitioner. The well-written text is liberally sprinkled with "box" summaries. Not quite the same as footnotes, these are factual outlines of key features bedded within the regular surrounding text, but still separate from it. For example, in a typical coverage of one disease, boxes set into the text of diabetes mellitus outline symptoms, complications, surgical management, symptoms of insulin shock, oral manifestations, and dental care. More than a concession to the man in a hurry, they are a pithy review of the surrounding text. Not so praiseworthy are the photographic illustrations. Reproductionwise, they could be much better. The reviewer recommends the adjunctive use of one of the readily available atlases of anatomy and pathology. The bibliography has commendably been returned to its function of reading guide, rather than a compendium of too promiscuously published articles. The experienced clinician may yearn for lses emphasis on advanced signs and symptoms in favor of really early detection. But a beginning must be made, and it is here in a good straightforward presentation of currently accepted information. LT. COL. JULES D. KARTMAN, USAF, DC

DRIVE, STRUCTURE AND CRIMINALITY, Criminobiologic Investigations, by *Hans Walder*, J.D. Translated by *Marvin W. Webb*, A.M., Ed.D. Revised and enlarged. 174 pages; illustrated. Charles C Thomas, Publisher, Springfield, Ill., 1959. Price $7.50.

This book is a refinement of Szondi test application and is almost meaningless to anyone not already sophisticated in Szondi technic. It is not recommended to anyone who lacks active interest in this particular testing method. The first 3 chapters attempt an overview of criminality and "drive structure" theory but say nothing particularly informative or surprising.

LT. COL. PAUL F. EGGERTSEN, USAF, MC

ELECTROHYSTEROGRAPHY, The Electrical Activity of the Human Uterus in Pregnancy and Labor, by *Saul David Larks*, B.S.E.E., M.S. (E.E.), Ph. D. 123 pages, illustrated. Charles C Thomas, Publisher, Springfield, Ill., 1960. Price $5.75.

This small monograph presents a study of the electrical activity of the parturient uterus. The first portion gives the historical background and a concise discussion of the bioelectric phenomena in tissue and their measurement. The remainder describes the method of using the particular instruments and the findings in normal and abnormal labor. The effects of pitocin stimulation of abnormal labor are shown, as is the developing electrical potential during the gestational period. The author believes that the uterus in labor behaves electrically as a single-chambered or auricle-like structure; that the contractions are controlled by a single pacemaker, usually right sided, and that the excitation is basically radial in normally developing labor. It is his intent to promote the continued interest in, and use of, electrohysterography as a further attempt at the comprehension of uterine function. This volume will be of particular value to the specialist interested in research.

LT. COL. WILLIAM C. HERNQUIST, USAF, MC

THE PSYCHOANALYTIC STUDY OF THE CHILD, edited by *Ruth S. Eissler*, M.D., *Anna Freud*, LL.D., *Heinz Hartmann*, M.D., and *Marianne Kris*, M.D. Editorial assistant, *Lottie Maury Newman*. 433 pages. International Universities Press, Inc., New York, N.Y., 1959. Price $8.50.

This book is the fourteenth annual issue of a series dealing with psychoanalytic studies, including theory, research, clinical papers, and clinical work relating to the development and psychiatric care of the child. The section on theory includes an article by Bing, McLaughlin and Marburg on narcissism; another by Eissler on ego mechanisms of isolation, its development, and its appearance in various syndromes; another by Greenacre on the functioning of play in the service of creative imagination; and a detailed paper by Spiegel, on the sense of self, its disturbances, and its relation to perception. There are also research project reports, such as those commented upon in a paper by Bibring on psychologic processes in pregnancy, and a paper by Anna Freud, having to do with research in psychoanalysis, in which a great many types of research are described in detail, notably that being done at the Hampstead Child Therapy Clinic. Of particular interest to many psychiatrists because of its value for general use and a good example of writing and study in the field of character development is the clinical paper by Jacobson, who describes "the exceptions," patients who have been afflicted or handicapped and behave as though their difficulties make them exempt from the ordinary rules and problems of existence or of adjustment. Other articles on the topic of religious identifications, severe ego pathology in childhood, corrective object relations of children, countertransference in the residential treatment of children, infantile precursors of the "thinking machine," a study of the dwarf, and one paper on the role of the nursery school as a diagnostic help to the child guidance clinic each contain some useful and informative material. In the field of applied psychoanalysis, Eissler describes in detail the environment into which the great German poet Goethe was born, an environment that probably played a significant role in his development. In 2 papers about the celebrated case of Schreber his "hereafter" and the "miracles" performed on his body are discussed. An article by Peller gives some very useful comments on the relationship between children's daydreams and their favorite books. This volume will of course find its maximum usefulness in the hands of those who practice psycho-

analytic therapy. Many of these articles could be presented more simply and clearly. As one military staff writer said to his subordinates, "It's better to throw away the first three paragraphs and print the last one because there in one small area is the meat of the question." Most of the papers in this volume would receive a better reception if this advice had been heeded. In general, this book, like much analytic writing, is rather heavy going at times but is well worth the effort if this can be done in an unhurried manner. This volume is recommended as a reference book for psychiatric libraries, in the training program for residents, and for those dealing with pediatric psychiatry.

LT. COL. PAUL J. SCHRADER, MC, USA

POLYSACCHARIDES IN BIOLOGY, Transactions of the Fourth Conference, May 21, 22, and 23, 1958, Princeton, N.J., edited by *Georg F. Springer*, M.D. 271 pages; illustrated. Sponsored by the Josiah Macy, Jr. Foundation, New York, N.Y., 1959. Williams & Wilkins Co., Baltimore, Md., 1959. Price $5.95.

This volume highlights in an informal manner some of the more recent and more interesting aspects of research on the polysaccharides and their implications to the field of medicine. The conference opens with a discussion, principally chemical in nature, of the analytic problems associated with the isolation, characterization, and synthesis of polysaccharides as found in a wide variety of biologic tissues. A generous number of tables of comparative data are included in this portion as well as some analytic schemata for the chondroitin sulfates. There follows a discussion of the relationship between metabolic and histologic changes occurring in epiphyseal cartilage of a widely studied laboratory animal, the rat, with some fine electron micrographs to point up the close relationship between cells and matrix. In addition, experimental work is cited on cartilage of rabbit ear and nasal septum, as well as on the role of mucopolysaccharides in gargoylism. Of particular interest to the biochemist will be the evidence for the structural proof of heparin and related substances. Closely associated with the discussion of heparin is that on the well-known mast cell and the significance of its mucopolysaccharide content in response to injurious stimuli. The remainder of the conference deals with biosynthesis of sulfated polysaccharides as studied by isotopic methods. A short discussion is devoted to nonbiologic polysaccharides and polysaccharides of plants. In this conference many comments, questions, and answers were pertinent, thought provoking and worthy of record, but the reader would find it easier if many others had been eliminated. In a conference of this sort the degree of freedom that has become a part of the Macy Conferences is generally laudable. The published record, on the other hand, is in a somewhat different category. It is intended for—and reaches—a larger and less specialized audience, and many will share the opinion that it should be organized and edited accordingly.

MAJ. RICHARD E. KRAUSE, USAF, MSC

CLINICAL OBSTETRICS AND GYNECOLOGY. Vol. 2, No. 4. Advances in Gynecologic Surgery, edited by *S. B. Gusberg*, M.D. Cesarean Section, edited by *Edwin J. De Costa*, M.D. 1,228 pages; illustrated. Paul B. Hoeber, Inc., New York, N.Y., 1959. Price $18 (4 quarterly issues).

This is the last number of the second volume of a series initiated to keep the busy obstetrician-gynecologist up to date by presenting a topic in a monographic fashion, yet with the advantage of the opinions of several authors, each an expert in his facet of the topic. The first part of this number concerns itself with cesarean sections, is 111 pages long, and is composed by outstanding men of the caliber of Kaltreider, Hasseltine, Riva, Waters, et cetera. The topic is covered from the standpoint of indications, technics, anesthesia, morbidity and mortality,

the management of the previously sectioned patient, and even postmortem sections. All in all, the subject is so thoroughly, yet concisely, discussed that few ends are left untied. The second part, 119 pages long, covers topics such as corrective procedures for congenital anomalies by Howard Jones, surgery for infertility by Burton and Mastrocanni, radiotherapy in gynecology by Corscaden, and conservative surgery for endometriosis by Scott. These articles, and others presented, are well developed and several are more inclusive than might be expected from the space allotted. These are, in fact, so complete that they will bring the uninformed totally abreast with current thinking. A third special section is devoted to gynecologic examinations and includes a discussion of many office procedures. Although directed mainly toward the student and general practitioner, it is quite likely that many specialists would find it worth reading. It could easily be made required reading for those in training programs with very beneficial results. All articles are well presented on readable paper. Many have excellent illustrations, and detailed statistical charts are kept to a minimum. All in all, this number is well above the level of many of its predecessors and is highly recommended to those interested in the field.

LT. COL. WILLIAM F. PETERSON, USAF, MC

CLINICAL PSYCHOPATHOLOGY, by *Kurt Schneider*, translated by *M. W. Hamilton*, B.A. (Lit. Hum.) Oxon., preface by *E. W. Anderson*, M.D., M. Sc., F.R.C.P., D.P.M. 173 pages. Grune & Stratton, New York, N.Y., 1959. Price $4.50.

The unobtrusive title and size of this volume are quite deceiving. Professor Schneider has put forth his concepts clearly and emphatically as perhaps only a German could do. His views regarding psychopathic personality, or what we call character disorders, are markedly in contrast to psychoanalytic views. Although this contrast is bound to provoke disagreement, the manner of presentation will leave no one wondering what the author's position is. The other major contribution of this work concerns his description of nuances in the schizophrenias and cyclothymia. This presents many subtle points of a descriptive nature not generally found in standard U.S. texts dealing with this material. I would hesitate to recommend this work to those who have not had previous knowledge of the subject matter. To those more advanced, it could be of considerable assistance.

LT. COL. JAMES F. DONOVAN, MC, USA

LABORATORY IDENTIFICATION OF PATHOGENIC FUNGI SIMPLIFIED, by *Elizabeth L. Hazen*, Ph. D., and *Frank Curtis Reed*. 2d edition. 150 pages; illustrated. Charles C Thomas, Publisher, Springfield, Ill., 1960. Price $7.50.

This book needs no introduction to those familiar with the 1955 publication. This second edition comprises 42 more pages than the previous issue. The expansion reflects revisions and additions that enhance the value of the monograph to students, technicians, and teachers in the field of mycology; for example, South American blastomycosis is now included, although the older name of the etiologic agent *Paracoccidioides brasiliensis* is given preference to the currently used terminology *Blastomyces brasiliensis*. Another useful addition is a table of differential characteristics of *Candida* species. The authors are to be commended for their successful efforts in improving the illustrative plates; most of them are much clearer than those in the first edition and those that were revised are superior to the earlier ones. The general format follows that of the first edition, which is good. The type is easily read, and the book is more attractively bound than the original monograph. This publication should be of great value as a handy reference in diagnostic mycology and as such is highly recommended.

CAPT. LA VERNE A. BARNES, MSC, USN

NEW METHODS OF STUDYING GASEOUS EXCHANGE AND PULMONARY FUNCTION, by *Alfred Fleisch*, M.D. Authorized translation by *Charles Corsi*, with a preface by *L. Michaud*. 116 pages; illustrated. Charles C Thomas, Publisher, Springfield, Ill., 1960. Price $5.75.

This small book deals with medical technical equipment that has been either invented or modified by Dr. Fleisch. The first apparatus considered is the "metabometer," a portable instrument for measuring basal metabolism in man. The machine devised is readily moved from place to place, gives the final reading in calories per 24-hours, and does not require complex calculations in order to determine the basal metabolic rate. The author has also adapted a "totalizer" and an electrical kymograph for physicians desiring a permanent record of their BMR findings. These are easily attached to the metabometer. The next apparatus that is deserving of consideration is the "metabograph," a technical innovation that simplifies tests of pulmonary function. It records vital capacity and its subdivisions of maximum expiratory volume per second and maximum ventilation. Significantly, these tests may be recorded at any oxygen pressure, at rest, or at any rate of work. This brings us to the next technical apparatus Dr. Fleisch has constructed—a "multiple setting, constant-energy ergostat." The use of these 2 machines in combination—the metabograph and the ergostat—provides a simple method of determining pulmonary function, especially in patients with silicosis, pulmonary fibrosis, and the chronic cor pulmonale type of heart failure. The book has numerous illustrations and adequate references, most of which are to European medical journals. It is recommended to all physicians and internists interested in pulmonary diseases and to the physiologist interested in metabolic research. Hospitals would do well to invest in this small monograph prior to setting up their pulmonary function laboratory.

COL. LEON J. NUMAINVILLE, MC, USA

SURGICAL TREATMENT OF BONE AND JOINT TUBERCULOSIS, by *Robert Roaf*, M.A., M.Ch. Orth., F.R.C.S. Ed., F.R.C.S. Eng., *W. H. Kirkaldy-Willis*, M.A., M.D. B.Chir., F.R.C.S. Ed., and *A. J. M. Cathro*, M.B., Ch.B., with a foreword by *Harold Boyd*, M.D., F.A.C.S. Illustrations by *W. Cannell*, M.C.S.P. 137 pages; illustrated. Williams & Wilkins Co., Baltimore, Md., 1959. Price $7.

Skeletal tuberculosis has become a rare condition in North America and to a somewhat lesser extent in the remainder of the English-speaking world. For this reason the new vistas opened up by the advent of antituberculous agents and by the recent technics in surgery have not been explored in the United States to the extent that they have in some other parts of the world. As Dr. Boyd points out in the forward "the progressive development in the treatment of disease requires changes in methods, but long-established therapeutic principles are not easily abandoned. This is particularly true when the disease is disappearing, for the paucity of cases makes impossible the testing of new therapeutic methods in a large enough series of patients to warrant valid conclusions. . . . The younger orthopedic surgeons have had little experience with tuberculosis and the older surgeons tend to think in terms of treatment in vogue before the advent of antibiotics." The book was written primarily as a guide for general surgeons without special orthopedic training who of necessity have to treat most of the skeletal tuberculosis in the less well-developed parts of the world. The material is organized by the regions of the body to allow a surgeon to look up treatment of one specific problem such as tuberculosis of the hip without reading the whole book. The resulting repetition dulls the interest of the reader who wishes to read it all. The authors advocate conservative treatment consisting of anti-

biotics, immobilization, and occasionally aspiration of the abscess in early cases with primarily synovial involvement or only minimal involvement of articular surfaces. In more advanced cases they recommend surgical evacuation of the tuberculous abscesses and removal of devitalized tissue under the coverage of antituberculous drugs. This is followed by arthrodesis. If indicated, bone grafts are placed in the area from which the abscess was evacuated and internal fixation is also utilized where needed without any greater incidence of complications than when it is employed in the absence of tuberculous disease. This is an excellent manual that should be in all medical libraries and possessed by all orthopedic surgeons. It is unfortunate that the binding is of poor quality and will not withstand the use the book deserves. CAPT. WILLIAM S. STRYKER, MC, USN

BONE AS A TISSUE, edited by *Kaare Rodahl*, M.D., *Jesse T. Nicholson*, M.D., and *Ernest M. Brown, Jr.*, M.D. 358 pages; illustrated. McGraw-Hill Book Co., Inc., New York, N.Y., 1960. Price $16.

"Bone as a Tissue" is the record of a 2-day conference on the various recent advances in the study of bone and its diseases. The first half-day session, moderated by Reifenstein, was devoted to osteoporosis. Sisson discussed formulas for determining the rate of cell activity and bone turnover from histologic sections. Urist presented over 800 older patients with severe "idiopathic" osteoporosis, in whom no evidence of estrogen, androgen, or cortisone disturbances were apparent but who tended to have low urinary calcium. Nordin focused attention on the fact that experimentally a low-calcium diet produces osteoporosis rather than osteomalacia. Wheedon compared the osteoporosis of normal bedridden volunteers, paralytics, and fracture patients in terms of calciuria and pointed out the need to consider the role of muscular and neurocirculatory reflexes. The second session, moderated by Comar, was devoted to the dynamics of calcium metabolism. Newman reviewed the principles of mineralization of bone, pointing out that the mechanism is more closely related to crystal growth kinetics than to solubility product. Bauer used radioactive strontium as a tracer to measure bone formation in various parts of the body by use of a counter. Gersh presented data on a method for direct study under the electron microscope of ground substance, dependent upon the affinity of ground substance for injected soluble ferrocyanide. Using radioactive calcium and radium, Marshall studied the long-term turnover of calcium. The third session, chaired by Wasserman, was devoted to the ultrastructure of bone. Jackson presented the results of a detailed histologic chemical and electron microscopic study of the development of the earliest chick bone. In a detailed study of density, chemistry, and electron microscopy of bone, Robinson demonstrated that the water content of bone belongs in 2 categories: that occupying the soft tissue space, and that directly involved in mineralized matrix. Engstrom reviewed the evidence, by various types of x-ray diffractions and electron microscopy, for the precise structure of the apatite crystals in bone. LeCroix presented the results of correlated studies of histochemistry, anatomy, and radioautographs. In the fourth, and last session, chaired by Howard, the chemical significance of Vitamin D, parathyroid, and citric acid in calcium and phosphate metabolism was discussed by Harrison, Copp, Smith-Freeman, and McLean, respectively.

The book is well bound, well written, well illustrated, a major contribution to the rapidly expanding literature on bone. It is a must for all those interested in metabolic problems of bone and bone disease and in the chemistry of mineralization. LENT C. JOHNSON, M.D.

CURRENT DRUG HANDBOOK, 1959–1960, by *Mary W. Falconer*, R.N., M.A., and *H. Robert Patterson*, B.S., M.S., Pharm.D. 161 pages. W. B. Saunders Co., Philadelphia, Pa., 1959. Price $2.75.

This paperback book contains specific technical data on about 1,000 drugs, which the authors have selected as being old drugs in common use and new drugs giving promise of lasting value. The size of the book necessarily limits the amount of information given for each drug, and some readers may take exception to the selection. Drugs are grouped together by types, utilizing 15 major categories, thus permitting comparison of drugs having similar actions. To find a specific drug, one can refer to the excellent index. The material is arranged in columnar form and includes major and secondary names, source, active principles, toxic symptoms and their treatment, dosage, mode of administration, and certain information regarding contraindications, incompatibilities, and problems in administration. The authors' avowed intent to provide a quick reference book, supplementing the information contained in standard pharmacology texts, has been realized. The nurse, in particular, will find it a very handy reference source.

LT. RICHARD L. SEDAM, MSC, USN

ATLAS OF ROENTGENOGRAPHIC POSITIONS, by *Vinita Merrill*. Vols. I and II. 2d edition. 636 pages; illustrated. C. V. Mosby Co., St. Louis, Mo., 1959. Price $32.50.

Revision of this standard textbook of roentgenographic procedures has been well done. The excellence and completeness of the text and illustrations of the original edition left little to be desired. Over 40 positions, including a number of time-tested old ones and a selection of new ones, have been added. The sections on angiography remain sketchy and laminography is barely mentioned. This work will be extremely valuable to both the technician and radiologist.

COL. PAUL A. PADEN, MC, USA

NEUROLOGY OF INFANCY, by *Anatole Dekaban*, M.D., Ph. D. 388 pages; illustrated. Williams & Wilkins Co., Baltimore, Md., 1959. Price $12.

Publication of this well-conceived and well-written work brings to our attention a pioneering enterprise in the ever-expanding field of pediatric neurology. Clearly illustrated anatomic and pathologic springboards are used to secure 2 objectives: developmental landmarks and clinical features. In assessing growth levels, however, considerable data are presented that in the interest of clarity might be limited to salient features at critical periods, e.g., newborn, 4 months, and 6 to 8 months of age. Furthermore, in ascertaining degrees of maturation, a simplified schema of examination may be preferred to a résumé of signs and reflexes that wax and wane in various periods of infancy. From the standpoint of pathogenesis the chapters on birth injuries and vascular disorders are exceptional. Particularly pertinent discussions of diffuse sclerosis and developmental speech disorders are also commendable. Appended references give authoritative insight and provide ample material for further intellectual penetration of the various subjects. In a book of this sort, it is, nevertheless, surprising to find relatively new entities, such as ataxia-telangiectasia, idiopathic hypercalcemia of infancy, and what is known as "leprechaunism," omitted. In the last analysis this is a scholarly masterpiece, with relatively minor deficiencies that can be easily remedied in subsequent editions. It presages another milestone in the closer association of pediatrics and neurology. Those with serious interest in infant diseases of the nervous system will profit by perusal of the contents.

LT. COL. ARTHUR J. LEVENS, MC, USA

PATTERNS IN PSYCHOSEXUAL INFANTILISM, by *Wilhelm Stekel*, M.D., edited and with an introduction by *Emil A. Gutheil*, M.D. 412 pages. Grove Press Inc., New York, N.Y., 1959. Price $1.95.

In this book Dr. Stekel goes his contrived and irresponsible way. The case histories are unbelievable and one would have to be unusually susceptible to give credence to the remarkable "cures" claimed in an offhand way. The color of the cover, yellow, is most apt for the type of "yellow journalism" it contains. This reviewer was relieved to find that there was ample historical precedent for his incredulous response to the book, in that Sigmund Freud, Ernest Jones, and other solid researchers considered Wilhelm Stekel as irresponsible, and even scientifically dishonest. There is the story that in a boastful moment Dr. Stekel told Dr. Freud a midget on the shoulder of a giant could see further than the giant. The withering return comment was that a louse on the head of an astronomer could not! Even at the low price of $1.95, this book should be bought only as an intellectual curiosity; should be prominently tabbed "not to be read seriously"; and should be taken with generous doses of salt. Since it is possible that someone naive and impressionable will take the book seriously, it should not be left about in libraries. It is to be hoped that further publication will be discouraged by this edition remaining unsold.

LT. COL. PAUL P. EGGERTSEN, USAF, MC

SOME PAPERS ON THE CEREBRAL CORTEX, translated from the French and German by *Gerhardt von Bonin*. 396 pages; illustrated. Charles C Thomas, Publisher, Springfield, Ill., 1960. Price $11.50.

Those who desire detailed background on the cerebral cortex will, no doubt, find considerable value in these selected articles, all translations except the concluding one, originally written in English, from Sherrington's laboratory. Beginning with Pierre Flourens' "the cerebral mass," the articles are presented in chronologic order. As stated in the preface, the articles have been selected mainly for their general interest and for the breadth of outlook. Perhaps the best part of the book is the 12-page introduction, in which Dr. Von Bonin presents a frame of reference for the ensuing articles, pointing out some of the salient features presented by the various authors and discussing their various contributions. From his introduction one might then be able to select for further perusal an article of particular interest or one relating to current problems. Since Dr. Von Bonin did not intend to include English or U.S. authors readily available in the original, it is easy to understand why he did not include any papers by Hughlings Jackson even though he paid tribute to him in the same introduction. The articles themselves are well chosen and fulfil the stated purpose. This collection should be placed on the reference shelves of libraries dealing with neurologic sciences.

LT. COL. ARTHUR J. LEVENS, MC, USA

THE ANTI-GLOBULIN (COOMBS) TEST IN LABORATORY PRACTICE, by *I. Dunsford*, Ph. D., M.I. Biol., and *Jean Grant*, F.R.C.P. 120 pages; illustrated. Charles C Thomas, Publisher, Springfield, Ill., 1960. Price $3.50.

The book is a pleasure. It is concise, authoritative and well written. The Coombs test is widely used today, especially in transfusion services for cross matching of blood. While it is a valuable procedure it is not foolproof. Now, if only the fools will refer to this book. And it is also a good reference for any others who want to know how to make Coombs serum or how to make Coombs serum work.

COL. WILLIAM H. CROSBY, MC, USA

PROSTHETIC PRINCIPLES—ABOVE KNEE AMPUTATIONS, by *Miles H. Anderson*, Ed. D., *John J. Bray*, C.P., C.O., and *Charles A. Hennessy*, C.P., C.O.; edited by *Raymond E. Sollars*. 331 pages; illustrated. Charles C Thomas, Publisher, Springfield, Ill., 1959. Price $10.

This book, a compilation of numerous studies and findings of the nationally integrated program of research and development, has several objectives. Although its subject matter should not be taken as a complete answer, it will serve as a comprehensive guideline in the fitting of above-knee prostheses. Quite an extensive chapter of the functional anatomy of the hip, thigh, and knee is adequately illustrated to show the anatomy with which the subject matter of the book deals and to give to the student adequate anatomic details for integration with the end objectives of an above-knee prosthesis. The general field of locomotion is covered in basic fashion to familiarize orthopedic surgeon, prosthetist, and therapist with the components and motions involved in an above-knee prosthesis. Unusually clear pictorial preparation of the fitting technics supplies the prosthetist with most of the data necessary for fabricating and aligning the limb. The book augments practical training by serving as a source of reference not only to the prosthetist in his work but to the therapist and the surgeon for evaluating the work of the prosthetist. A part of the book is devoted to the discussion of such things as the cosmetic covers, the Sach foot and its application, the hydra-cadence foot for use with the adjustable leg, and the use of the alignment duplication jig for the correct alignment of such hydra-cadence units. Although the book cannot possibly show every method evolved for fitting above-knee prostheses, it is, as a training manual and reference book, comprehensive enough to permit any skilled prosthetist to fit a limb, and possible variations of such technics should be perfectly obvious to those skilled in the art. The book is not designed to lay down a hard and fast rule for the fitting of all amputees, and although describing specific methods, does not preclude other technics specifically adaptable to certain types of amputations.

COL. MAURICE J. FLETCHER, MSC, USA

HISTOCHEMISTRY, Theoretical and Applied, by *A. G. Everson Pearse*, M.A., M.D., Cambridge, M.R.C.P., D.C.P., London. 2d edition. 998 pages; illustrated. Little, Brown & Co., Boston, Mass., 1960. Price $20.

This second edition of Pearse's outstanding text is almost twice as large as the first edition. There are 29 chapters of subject matter in contrast to the previous 17. The number of well-chosen illustrations has also been increased. The majority of the color plates are truly excellent. The first chapter gives not only a concise, but a complete history of histochemistry. The other chapters deal systematically with the usual subjects of microscopic histochemistry, such as fixation, sectioning, immunohistology, carbohydrates, proteins, enzymes, and pigments. The only topic that is not adequately covered is microincineration. Histochemical reactions are given reasonable explanations. Where necessary, structural formulas of organic reactants are used. The author's opinions are clearly stated and divergent points of view are also presented. Numerous references are included. The final chapter gives an indication of what is in sight for the future of histochemical methods applied to electron microscopy. Approximately one fifth of the book consists of a collection of appendixes, containing details and results of practical histochemical technics. Tables of molecular weights and sources of histochemical reagents are included. This text is recommended for use in all pathology and histology laboratories. Experts in various phases of the subject will not agree with all of the author's statements or interpretations but even the expert will find the book useful.

FRANK B. JOHNSON, M.D.

ASSESSMENT OF HUMAN MOTIVES, edited by *Gardner Lindzey*, with 9 contributors. 273 pages. Grove Press, Inc., New York, N.Y., 1960. Price $1.95.

In the preface, Lindzey states, "This volume is intended to provide an introduction to the thought and investigation of a number of distinguished psychologists who have contributed to the assessment and understanding of human motivation." Eight of the 9 chapters consist of papers presented at a conference held at Syracuse University during the spring of 1957. The first chapter, by Gardner Lindzey, attempts to scan and summarize the general status of motivational assessment within psychology, to highlight "the over-all importance for psychology of inquiry concerned with matters of method or procedure, and to outline the key issues relevant to the assessment of motives." Lindzey also prospectively summarizes the general position of each contributor and relates this position to the key issues already outlined. As is often the case in a compilation of conference papers, there is a wide range in both the content and style of presentation of the 8 primary contributors. George A. Kelly, in a somewhat anecdotal presentation, completely repudiates the concept of motivation as a necessary construct, postulating instead an understanding of behavior in terms of *personal constructs* that are said to operate cognitively, as the individual anticipates and reconstrues life situations. Leon Festinger, although accepting the more conventional framework of motives as hypothetic constructs, proposes and illustrates the importance of a new motive, *cognitive dissonance*, which is defined in terms of the simultaneous existence of incompatible beliefs. George S. Klein, again from the framework of perceptual and cognitive psychology, concerns himself with the study and measurement of what he calls *cognitive attitudes* or *styles*, characteristic ways in which people go about thinking, perceiving, and actualizing drive states. Roy Schafer, assuming a more clinical and psychoanalytic approach, defines, exemplifies, and discusses the concept of *regression in the service of the ego* as an important dynamic concept in personality assessment. In a penetrating and provocative paper on the psychoanalytic interview as a research technic, Irving L. Janis discusses some of the major difficulties that have resulted in "legitimate scientific criticism concerning problems of sampling, replication, and accurate reporting." He then proposes changes that he feels would help bring scientific respect to psychoanalytic research and expand its scope beyond its traditional field of psychopathology. By far the most hard-headed and systematic approach to assessing human motivation—and the most pious and bigoted manner of presentation—is that of Ramond B. Cattell. In his chapter, Cattell develops an extremely technical *dynamic calculus* for studying human motivation through factor analysis of human attitudes (or *attitude-interest strengths*, as he prefers), and demonstrates quite convincingly the potential merit and predictive utility of such a technic. Henry Murray's witty and informal paper discusses some of the issues related to direct and indirect measurement of human motivation, reports some interesting research findings related to Thematic Apperception Test analysis, and proposes a concept of *ascensionism* as an important human motive. In the final chapter, Gordon Allport discusses problems relating to the "units" that should be employed in the study of human motivation, and, in his characteristic style, strongly argues for an approach that places the uniqueness of individual motivation in primary perspective. Irrespective of one's agreement or disagreement with any of the contributors, and despite much variability in ideas and style of expression, this collection of papers is felt to be unusually interesting and provocative. Although it may be somewhat technical and "academic" to be of interest to other professional groups, it is recommended reading for all psychologists.

CAPT. JAMES L. HEDLUND, MSC, USA

New Books

Books received by the U.S. Armed Forces Medical Journal *are listed in this department for the information of readers, and as acknowledgment and appreciation of their receipt from the publishers. Those of greatest interest will be selected for review in a subsequent number of the* Journal.

Medical Department of the United States Army. Surgery in World War II. Neurosurgery, Volume II. Editor-in-chief, Col. *John Boyd Coates, Jr.*, MC, USA. Editors for Neurosurgery, *R. Glen Spurling*, M.D., and *Barnes Woodhall*, M.D. Associate editor, *Elizabeth M. McFetridge*, M.A. 705 pages; illustrated. Historical Unit, Army Medical Service, Office of the Surgeon General, Department of the Army, Washington, D.C., 1959. Superintendent of Documents, U.S. Government Printing Office, Washington 25, D.C. Price $7.

Diabetes, with a chapter on Hypoglycemia, by 54 authors. Edited by *Robert H. Williams*, M.D. 793 pages; illustrated. Paul B. Hoeber, Inc., New York, N.Y., 1960. Price $20.

Recent Advances in Surgery, edited by *Selwyn Taylor*, D.M., M.Ch., F.R.C.S., with a foreword by *Sir James Paterson Ross*, K.C.V.O., M.S. 5th edition. 500 pages; illustrated. Little, Brown and Co., Boston, Mass., 1959. Price $13.

Methods in Medical Research, Vol. 8. *H. D. Bruner*, editor-in-chief. Life History of the Erythrocyte, *Walter S. Root*, editor; Measurement of Responses of Involuntary Muscle, *A. M. Lands*, editor; Peripheral Blood Flow Measurement, *H. D. Bruner*, editor. 368 pages; illustrated. Year Book Publishers, Inc., Chicago, Ill., 1960. Price $9.75.

Functional Anatomy of the Limbs and Back, A Textbook for Students of Physical Therapy and Others Interested in the Locomotor Apparatus, by *W. Henry Hollinshead*, Ph. D. 2d edition. 403 pages; illustrated. W. B. Saunders Co., Philadelphia, Pa., 1960. Price $9.

The Meaning of Death, edited by *Herman Fiefel*, Ph.D., with 21 contributors. 351 pages. The Blakiston Division, McGraw-Hill Book Co., Inc., New York, N.Y., 1959. Price $6.50.

Diseases of the Nose, Throat and Ear, A Handbook for Students and Practitioners, by *I. Simson Hall*, M.B., Ch. B., F.R.C.P.E., F.R.C.S.E., 7th edition, 467 pages; illustrated, 8 color plates. Williams & Wilkins Co., Baltimore, Md., 1959. Price $5.

Peripheral Facial Palsy, Pathology and Surgery, by *Karsten Kettel*, M.D., with a foreword by *Terence Cawthorne*, F.R.C.S. 341 pages; illustrated. Charles C Thomas, Publisher, Springfield, Ill., 1959. Price $19.50.

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